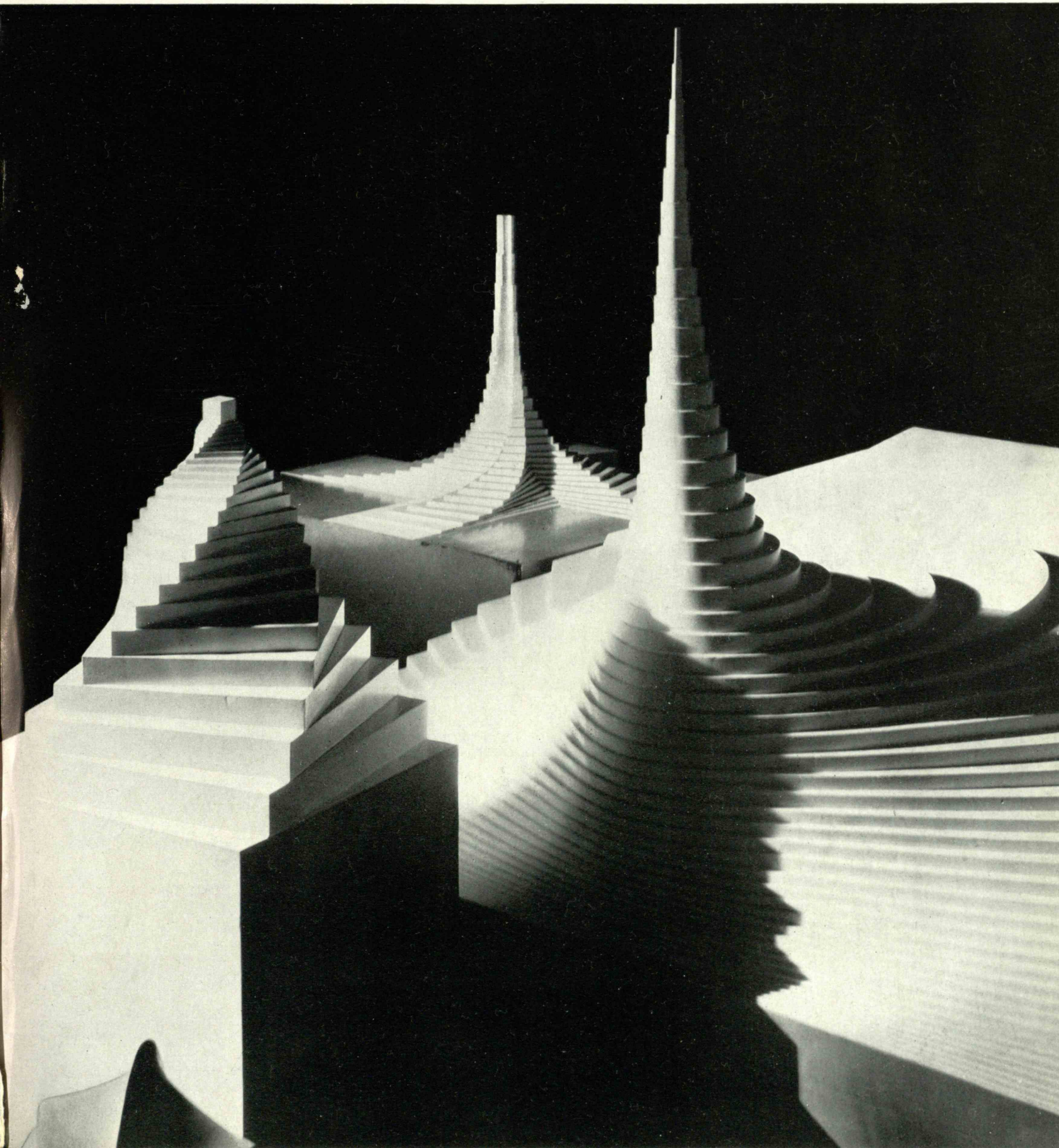


*February* 1938

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office



# technology review

Published by MIT

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*They'll give you*  
**MORE PLEASURE**

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## THE TABULAR VIEW

IN this space two issues ago, we listed some of the articles suggested by readers for The Review and asked for further ideas. Here are two typical responses:

FROM C. A. SOUTHWICK, JR., '28:

In the December Review, under The Tabular View, you have a list of articles which have been suggested by readers. I wish to second the suggestion that an article be published dealing with the recent advances in, and a critical comparison of, the various methods of color photography. . . .

I also suggest that an article dealing with recent developments in the plastic field would be extremely interesting, and also one dealing with the developments of the functional properties which can now be imparted to paper and fiber so that they compete with tin plate for many uses.

I still enjoy The Review although I do notice somewhat of a change from a few years ago. For reasons which are hard to define I have the feeling that it does not seem quite as interesting to me as it used to be.

South Norwalk, Conn.

Are there other readers who share Mr. Southwick's feeling about recent issues of The Review? An article on color photography is now in preparation.

FROM WILLIAM F. WHITMORE, '38:

The articles and photographs in this number [December] are of your usual excellence. I especially liked the article on better automobiles. The next task is to persuade some manufacturer to act on it! Sometime I wish you'd have an article on current progress in geophysics. I've heard enough about it to realize that it's important, but can't offhand think of any good popular summaries of, for example, geophysical prospecting, earth structure, and so on.

Hingham Center, Mass.

BEFORE I reformed," writes RUTHERFORD BOYD (page 169), "I was art director of five or six leading magazines. I graduated into advertising illustration and designing, and have spent most of the past 15 years in research in design, in contributing to various magazines, and in lecturing." ¶ Said *Time* in a recent article: "Last year Gray published his first book, *New World Picture*. It . . . won the approval even of such tough-minded critics as Massachusetts Institute of Technology's *Review*." We still seem to be expressing tough-minded approval of GEORGE W. GRAY, as this issue proves, with its article by him on page 172 and a review of his last book on page 167. ¶ In his article on page 175, S. PAUL JOHNSTON, '21, speaks of those days of wide-eyed wonder when he was a flying "kaydet." As editor of *Aviation* he still exhibits justifiable excitement over the rapid development of aeronautics. ¶ The man who joins with PRESIDENT COMPTON in presenting the prospectus for Technology's labor relations service (page 178) comes appropriately and with hearty welcome before any Technology audience, being, as he is, the son of Technology's famed President, R. C. MacLaurin. Born in New Zealand, W. RUPERT MACLAURIN was educated at Harvard and at Trinity College, Cambridge, and came to the Institute as assistant professor of economics from the Harvard Business School.

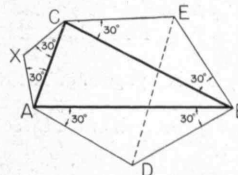
No. 4

*Just for Fun!*

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WE will pay \$25 for what we consider the best solution *{with proof}* of the following problem:



STARTING with any triangle ABC, construct three exterior triangles having base angles of 30° and vertices at D, E, and X—as indicated in the diagram. If the distance DE is taken as 100, what is the distance DX? (The answer is a definite number; not a formula!)

This competition closes Nov. 1, 1938. In case of a tie, the prize will be divided.

Industrial "puzzles" are our specialty.  
Definite prices for specified results.

**CALIBRON PRODUCTS, INC.**  
West Orange, New Jersey

*-only a button* **BUT...**

It must be true in color and form. It must be strong. To insure these qualities, molds should be checked constantly against off-temperature cavities. For such a purpose, the Cambridge Mold Pyrometer is ideal. It is handy to use — takes only a few seconds. It is rugged and accurate — an instrument that Powder Manufacturers, themselves, recommend.

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**INSTRUMENT CO INC**

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Pioneer Manufacturers of Precision Instruments



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# MAIL RETURNS

LETTERS FROM REVIEW READERS

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## *Even in the Ads*

FROM THEODORE M. EDISON, '23:

Because of the interest which your articles on puzzles aroused, we decided to use puzzles in our advertisements [Calibron Products, Inc.] this year. We hope that your puzzle fans will find further stimulation in our new prize offer [page 153] for the best solution of a really astonishing problem.

Our puzzle which appeared on page 57 of *The Review* for December, 1937, read: "With two 4's and the ordinary symbols of arithmetic and algebra it is possible to express each of the three numbers 32, 36, and 64 — but can you do it?" Some solvers used letters, or exponential figures other than the two 4's, in their solutions, but we should like to say that there are solutions employing recognized mathematical symbols which do not require the use of any such letters or figures. (If letters were allowed, any number whatever could be formed without the necessity of using the two 4's, because  $N/N$  equals one, and units could be added together indefinitely.)

We should be glad to learn what solutions your readers get to our puzzles.

*West Orange, N. J.*

## *How Can Today's Car Be Improved?*

**TOWARD BETTER AUTOMOBILES,** published in *The Review* last December, is still echoing across the country, judging from the newspaper clippings and letters that are still flowing across the editorial desk. In publishing this article, the Editors invited readers to send in their own comments to be added to the appraisals of today's car summarized in the article. Here are samples of the responses received:

FROM FRANK M. EXLEY:

I have just finished reading your article, "Toward Better Automobiles," and think that your preliminary survey shows many ways for improvements. I concur in practically all of them. There is one basic factor which I find unmentioned in the report: It is that of the excess dead weight of the modern automobile. This is a factor that enters into the economics of operation by increased gas mileage, increased mechanical friction, and excess tire wear.

The lightest present model pleasure car weighs about three thousand pounds. My weight is 150 pounds. Why should it be necessary, in order that I might be transported from one destination to another, that I should also play host to a ton and a half of metal and rubber? The pay-load dead-weight ratio is too small, even when five passengers are carried.

The horsepower dead-weight ratio today is about one to 30 in the small-car field, and the manufacturers have brought down this ratio only by hitching up more horses and not through reduction in weight. Why should it be necessary for one horsepower to move 30 pounds in rolling motion? Manufacturers claim that weight is needed to give roadability and easy riding. The bunk of this is shown by the fact that Indianapolis Speedway cars weigh slightly over twelve hundred pounds but hold the bricks at about 120 miles per hour, and if easy riding is a function of weight, why not use five-ton trucks for ambulances?

The solution lies in design. Eventually automobiles may advance with the technical sciences. If the body were redesigned to act simultaneously as chassis and passenger protector along the lines of stressed-skin design, considerable weight could be eliminated without resort to alloys. The body would act as a through girder and not be a pseudo-streamline teardrop, firmly fastened to the chassis with four, strong, one-half-inch bolts on rubber washers.

The prevalence of the semidoughnut type of tire offers hazards when tire failure occurs. When a 28" x 16" x 6" tire fails, the axle drops down from 14" above the roadway to only 8", causing the car to steer badly to that side. In addition, the deflated tire gives extra drag so that it is difficult or impossible to steer the car. If there were fitted to the wheel inside the gauge of the car, and in the same plane as the

wheel, a steel disk, say 24" in diameter for this sized tire, this disk would make rolling contact with the ground at tire failure, thereby eliminating four inches of the drop and all of the drag of the flat tire. . . .

*Savannah, Ga.*

FROM WILLIAM W. EATON, '17:

. . . Despite the maledictions heaped on the manufacturers and service stations by your engineers and scientists, I still think that the modern car is an amazingly beautiful, safe, comfortable, and efficient means of transportation, so long as the roads are dry. But let the ice come . . . and driving a car immediately becomes a nerve-racking chore at best, and a vicious danger at worst.

What I mean is that with all the improvements in safety and comfort, automotive engineers have done little or nothing toward eliminating the danger of skidding. Better equalization of brakes and improved tire design have helped, but no real solution of the problem has been approached. After every freeze, the papers are full of accidents, more or less disastrous to matériel and personnel, as a result of skidding.

I have often wondered if it would not be possible to design an apparatus which could be put into play in slippery weather and which, by gripping the road or otherwise, would automatically check the sideslip of a car at its inception. The idea sounds fantastic, and in the form expressed, doubtless is so. But at the same time, it seems as though the brains that have brought the modern car to its otherwise nearly complete perfection should be able to grapple with, and solve, this last problem. When we can drive as safely and as comfortably over snow-covered or icy roads as we now do in clear weather — then indeed will the motoring millennium have arrived.

*Canton, Ohio*

FROM MARVINE GORHAM, '93:

. . . My principal criticism of the modern car is the senseless grille in front of the radiator and the space behind it. Also, the excessive space under the hood. The designers of car lines would say that these two features are necessary to the beauty of the car. I can draw an analogy between autos and women's styles. Fifty to 60 years ago women's styles demanded enormous hoop skirts and bustles, yet in these days we look with pleasure on the trim lines of a woman's garb. If the motor and radiator of a car were housed, or shall I say clothed, in a space no greater than is conveniently necessary, it would be a very short time before the car as a whole would be pleasing to the eye. You don't find a locomotive or an airplane designer deliberately creating a lot of unnecessary space in his vehicle.

I contend that the modern superspeed, high-compression engines are dependent for successful performance on the exact synchronization of three important functions, viz., ignition, carburation, and compression. Let any one of these fail partially, and perfect function fails. If the breaker gap becomes minutely too wide, the timing is out. If 1/32 carbon is deposited, the compression becomes too high. In my opinion, engines should be slower, heavier, of lower compression, and not dependent on minutely exact distributor timing. These, with decreased engine and radiator space, would make "Toward Better Automobiles."

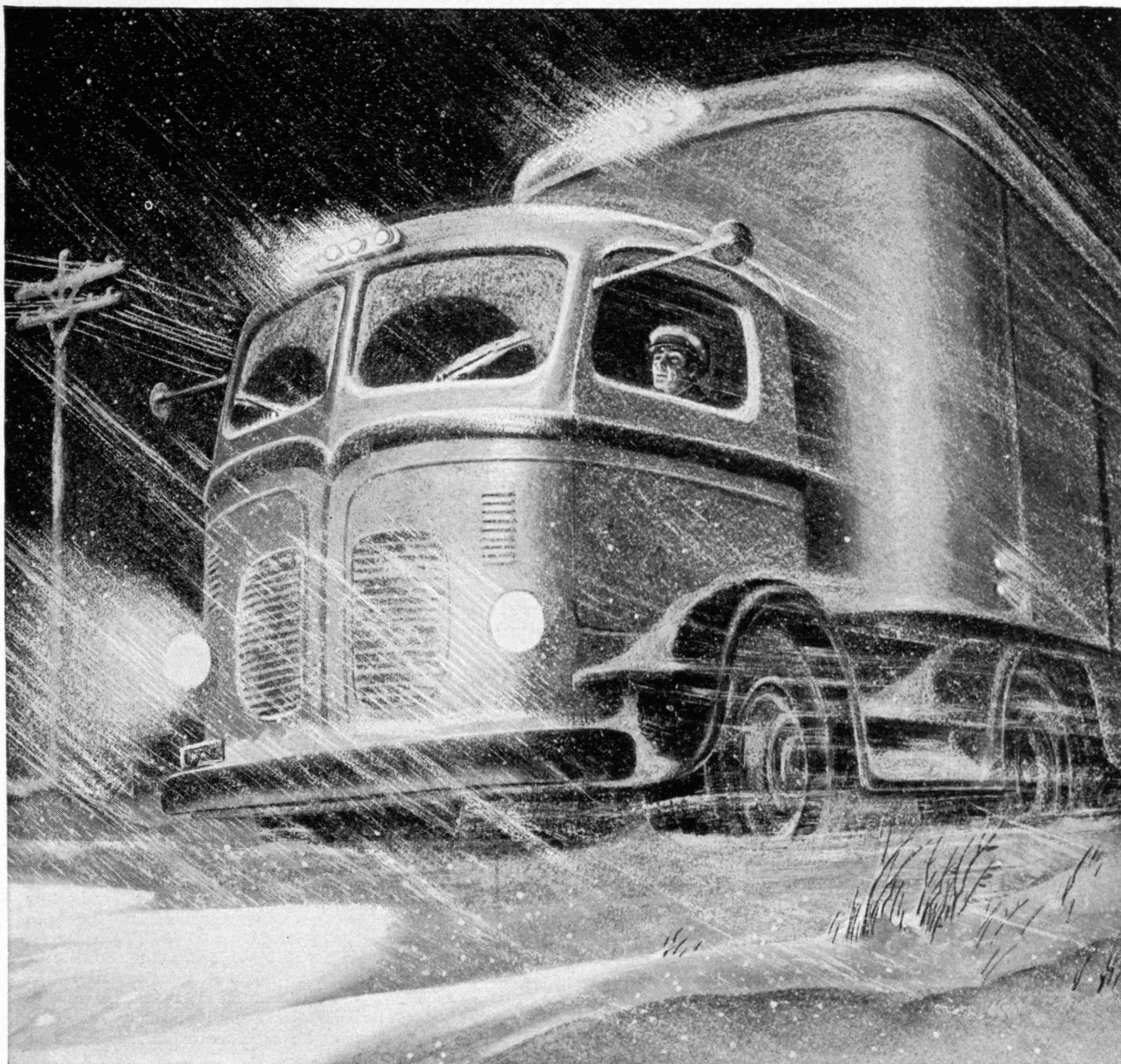
*Buffalo, N. Y.*

FROM F. E. GLANTZBERG, '27:

I am not a scientist, but am interested nonetheless in what I hope will prove to be a successful crusade toward better automobile values. I heartily concur in every criticism aired in the December Review, and the following are a few of my own.

It seems to me that the airplane designers have satisfactorily solved the problem of finish with stainless-steel or alloy, paint-free exteriors — certainly applicable to automobile design. Automobile designers can also profit by the lead of the airplane designers in not only providing up-and-down and forward-and-back adjustment of the driver's seat, but also finger-tip or, rather, toe-tip control of clutch, brake, and accelerator length — a matter of the most elementary design.

(Concluded on page 156)



## SUB-ZERO DEPENDABILITY



The toughness of steel at low temperatures is a vital factor in the performance of many different types of machines. Just for example, hundreds of motor vehicles must operate every winter at temperatures that make good sub-zero impact strength in highly stressed parts a necessity.

Molybdenum steels, when properly heat-treated, have excellent impact properties at low temperatures. Investigation shows that they retain their toughness remarkably, even at temperatures as low as  $-90^{\circ}\text{F}$ .

Consequently, Molybdenum steels offer great possibilities for the manufacturer of equipment that must work either continuously or intermittently at low temperatures. Advantage can be taken of their established price and fabricating economy, with perfect assurance of their performance.

We will be glad to send detailed information on the low-temperature impact properties of several widely used Molybdenum steels to any one interested. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

**CLIMAX MO-LYB-DEN-UM COMPANY**

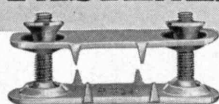
# MOLY



## for Joining and Repairing CONVEYOR BELTS

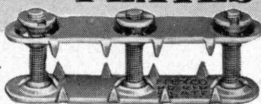
**FLEXCO HD**

### BELT FASTENERS



U. S. Pat.  
1,382,799

### RIP PLATES



FLEXCO HD BELT FASTENERS make a tight butt joint of great strength and long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Five sizes in steel and alloys.

FLEXCO HD RIP PLATES are used in repairing rips and patching conveyor belts. The added width gives a desirable long grip on the edges of the rip. Consultation on belt joining and repair invited. Sold through jobbers and belting houses the world over.

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In Eng. at 135 Finsbury Pav.

London, E. C. 2.

Sole Manufacturers



### AT COULEE DAM

On the high speed 60 in. conveyors, handling up to 2,500 yards of rock and earth per hour, FLEXCO HD FASTENERS are used and FLEXCO HD RIP PLATES were developed. They have been the means of returning thousands of feet of ripped and punctured belting to satisfactory service.

**Dependable  
Precision —**

Ask for Catalog

**BROWN & SHARPE MFG. CO.**  
Providence, R. I.

**BROWN & SHARPE  
TOOLS**

## MAIL RETURNS

(Concluded from page 154)

Mr. Ford seems to have started the movement in the right direction by reducing horsepower (on his smaller model). His cars have always been roomy, the battery is conveniently located under the hood, and while he has several innovations to recommend his car over others, still there is ample room for improvement in the matter of moving the engine aft, providing built-in summer and winter air conditioning, quick-changing wheels, better front-spring design to provide better tire wear, sliding top panel for summer driving in clear weather, and, above all else, simplification and elimination of the gadgets. . . .

Langley Field, Va.

FROM THEODORE G. MILLER, '02:

I agree with most of the complaints reviewed in your article, "Toward Better Automobiles," but why wouldn't most of them be eliminated by some such construction as light engine in rear, with wheel base full length of car (no overhanging), so that entire interior of car, including space now used for long hood and running boards, would make a large, low, level floor on which passengers could adjust individual seats and move about. Long wheel base would give more comfort, and engine in rear would hold rear of car on highway. Seems as though the removal of weight from front end would permit lower steering gear ratio and consequently less "winding up" of steering wheel in making turns, and so on.

I would like a car with more interior space but less exterior length, but at no greater cost than today's low-priced cars. Can you make delivery, 1-1-39?

P.S. Pet gripe is advertising such as this: "World's lowest priced, full size, six cylinder, four door sedan with blue paint, safety glass in head lights, Z-C Spark Plugs and curved door handles."

Elmira, N. Y.

## Imitation is Death

FROM SAMUEL JOROFF, '34:

The question of what should be the proper façade and architecture of the new gymnasium building is a very good and important one to be raised at the present time by Mr. Mayer '19 [see The Review for December, page 58]. The subject of exterior design of the Technology buildings has already been a bone of contention among most Tech men. What has already been done with the erected buildings is one matter. What should be done with our future buildings is another question and it should not lean for an answer on what has been done in the past.

It must be remembered that though the main group of the Technology buildings has been finished in the Classic style, not all have been so designed. The power plant, a number of the lab buildings near Vassar Street, and the two most recent dorm units in their exteriors express more of the spirit of our land and times than that of Rome, dead centuries ago. I wonder what the inhabitants of the Tech dorms would say and do if they had to spend their growing years inside the marble walls of a Greek temple. It is true that at times some individuals may be mistaken for Roman gladiators because of the brief attire they may adopt during their informal moments. But though some of their quiz answers may seem like Greek to their professors, I do not believe they would like to live in the cold atmosphere generated by Classic walls.

My first impression of the proposed front of the gym is that it is very imposing, cold, and formal (more like a mausoleum). For such to be the home of active, energetic students during their hours of athletic recreation and sport is like making a happy youth wear a shroud for his clothes.

Technology represents the best in scientific thought, in the search for new truths, in the advancement of new ideas in all fields of science, engineering, and architecture. "Imitation is death." So said one of our great American writers. Every time that we copy ancient methods of thought and design, so do we make ourselves so much older in mind and spirit. My vote is for a restudy of this façade, to create one more in keeping with the real spirit of Technology.

Pittsburgh, Pa.

## OF INTEREST TO TELEPHONE USERS

I think many people have only a vague idea of how our company functions within the Bell System, and how a unique business philosophy is operating to make your telephone service increasingly dependable and economical. This advertisement is the briefest possible statement of the philosophy that guides the Western Electric Company.

  
PRESIDENT

In 1882 the Bell System became convinced that the best way to assure uniformity of equipment necessary for universal telephone service was to control its manufacture through *one* organization. To this end it acquired the Western Electric Company, which operates under this three-fold policy:

### **1. To make telephone apparatus of high quality.**

This in itself is not unusual. What *is* unusual is that every item of equipment in the vast network of the Bell System must coordinate so perfectly that from any Bell telephone you can talk clearly with any one of the millions of others. Can you think of any other product which must meet such an extraordinary test?

### **2. To work for efficiency and lower costs.**

Whether it be in purchasing materials—or in manufacturing the 43,000 items of telephone apparatus—or in distributing all this equipment to the Bell companies, Western Electric is always seeking the better way. As a result it

has a progressive record of methods developed, products improved, economies effected, and costs lowered.

### **3. To keep prices at the lowest possible level consistent with financial safety.**

Western Electric furnishes most of the telephone equipment used by the operating companies of the System. By combining their requirements it is able to manufacture more economically; and it eliminates selling expenses and credit losses. The resulting savings it passes along to its telephone customers in the form of lower prices.

On these sales the policy of the Company is to set the lowest prices which will enable it to pay fair wages to its employees, to earn a fair return on the money invested in the business,

and to maintain the Company's financial stability.

This policy of voluntarily limiting profits is reflected in the Company's financial record. In recent years it has earned on its investment a rate of return only about half as large as that of a representative group of comparable manufacturers, and over a period of twenty years this rate has averaged less than 7%.



This set-up within the Bell System results in low costs to your Telephone Company, and thus Western Electric contributes its part in making Bell Telephone service dependable and economical.

# Western Electric

BELL SYSTEM SERVICE IS BASED ON WESTERN ELECTRIC QUALITY



**S**IX months was the maximum service delivered by several different makes of belting on this hog drive in the Saunders & Cox lumber mill, Williamston, N. C. A heavy load, fairly high speed operation, sharp reverse bends, all combined to make stretch and slip a constant problem and frequent repairs were necessary to take out slack.

Then in May 1936 a Goodyear COMPASS "40" Belt made truly endless was fitted to this drive on specification of the G.T.M. —Goodyear Technical Man. From that day on trouble vanished like magic. Slip has ceased to be a worry and stretch has been practically negligible. Today, 21 months later, the COMPASS is still pulling the drive perfectly and shows little sign of wear.

The Goodyear COMPASS Belt will give you the same outstanding service on your belt-eating drives because it is the *most nearly stretchless belt built!* Literally thousands of records similar to the above prove that. The G. T. M. will be glad to help you reduce your belting costs—to bring him to your office just write Goodyear, Akron, Ohio, or Los Angeles, California, or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

**BELTS  
MOLDED GOODS  
HOSE  
PACKING**

Made by the makers of  
Goodyear Tires

# TRIPLES BELT LIFE on HOG DRIVE



THE GREATEST NAME  IN RUBBER  
**GOOD YEAR**



Harold M. Lambert

# THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 40, NO. 4

CONTENTS

FEBRUARY, 1938

## THE COVER

THEMES IN ABSTRACT DESIGN (See page 169)

By Rutherford Boyd

DOMES OF MANY SHADOWS . . . . .	FRONTISPIECE	160
THE SHAPE OF THINGS TO COME . . . . .	BY RUTHERFORD BOYD	169
<i>Design, the Link between Science and Art</i>		
RUBBER AND LIFE . . . . .	BY GEORGE W. GRAY	172
<i>Toward a Better Understanding of Living Processes</i>		
BIG BOATS BOOM . . . . .	BY S. PAUL JOHNSTON	175
<i>Superliners for Tomorrow's Service</i>		
THE ENGINEER IN INDUSTRIAL RELATIONS		
By KARL T. COMPTON AND W. RUPERT MACLAURIN		178
<i>The Labor Relations Bureau at M.I.T.</i>		
TABULAR VIEW . . . . .		153
<i>Contributors and Contributions</i>		
MAIL RETURNS . . . . .		154
<i>Letters from Review Readers</i>		
THE TREND OF AFFAIRS . . . . .		161
<i>News of Science and Engineering</i>		
THE INSTITUTE GAZETTE . . . . .		181
<i>Relating to the Massachusetts Institute of Technology</i>		

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Paul J. Woolf

### DOMES OF MANY SHADOWS

*At night New York's Hayden Planetarium provides a spectacle without as well as within. The wonderfully light concrete-shell dome seems to express its construction best at night. Note the curious optical pattern in the sky*

# THE TECHNOLOGY REVIEW

Vol. 40, No. 4



February, 1938

## The Trend of Affairs

### *How Much Do Engineers Make?*

ON the authority of George Bernard Shaw, lack of money is the root of all evil. If this concept is sound — and some of the wisest men since Diogenes have expressed the notion that it is — engineers, as a class, walk a comparatively straight and narrow path. Basing its conclusions on what are probably the most comprehensive data ever presented in regard to the incomes of a professional group, the Bureau of Labor Statistics has recently made public figures which show, for instance, that in 1929, when the average yearly income of all employees in the United States was \$1,450, the median engineer's salary was \$3,412, and that for engineers with ten years of experience, average incomes ranged about the \$4,000 level — a figure which assumes more significance when one realizes that even in 1929 only 6.4 per cent of all incomes were larger. While the profession lost ground during the depression at a somewhat faster rate than did the average trade, the median engineering income in 1934 was \$2,296 — still presenting a favorable comparison with the \$1,135 that had to support the average American employee.

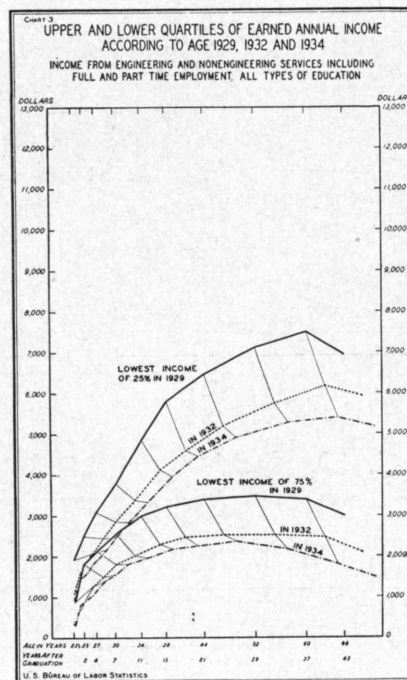
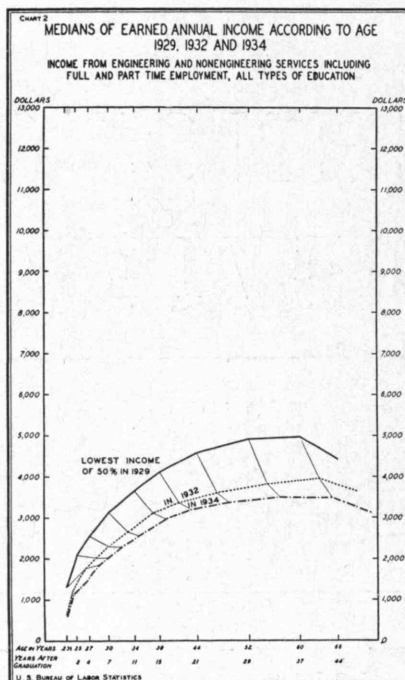
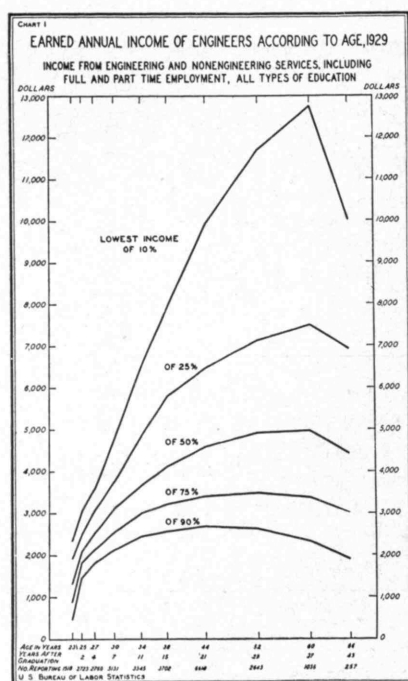
Nevertheless, a median income is not legal tender; an average engineer is an abstraction; and the \$7,500 or more which could, in 1929, supply maids and mink coats to one engineer's wife in every ten was cold comfort to another spouse whose husband's pay check could hardly be distinguished from that of a skilled laborer. Whatever the reasons for these discrepancies, the facts remain that one engineer in every ten manages to get four or more times as much for his services as the bottom member of the group, and that fortune continued to favor the fortunate during the depression by reducing the top 10 per cent of incomes by an average of 31 per cent while reducing the bottom 10 per cent by more than half.

Flattering are the graphs (see next page) prepared by the bureau, which show that the earning capacity of engineers is sustained late in life and that it advances steadily with increasing experience. In this advance can be detected three distinct phases: an initial sprint of a few years, followed by two longer periods of slower increase. But again, while the most affluent engineers find their most productive years (financially, at least) to be in the early 60's, the lower 10 per cent reach their peak during the early 40's. In 1929, incomes for 60-year-old engineers in the highest paid 10 per cent ranged from \$13,000, upward; at the same age level, the least well paid 10 per cent were earning \$2,300 or less, while the 40-year-olds in the latter class were getting, at the most, about \$3,000.

If the marriage brokers of this country had a trade publication, perhaps the comparison of engineering salaries with those in other more or less professional fields might be a simple task, but as the matter stands, one must gather one's data on this subject where one may. The Bureau of Labor Statistics has found, for instance, that in 1934 only about 28 per cent of newspaper editorial workers received more than \$2,500 a year; by contrast, 25 per cent of the engineers earned \$3,400 or more, in the same year. Another survey (not by the bureau) shows that average salaries for banking executives in unit banks range from \$2,000 to \$3,770, and for executives in branch banks, from \$3,000 to \$9,100.

The close connection between engineering and industrial management, as exemplified by the recently disclosed fact that an engineer is 12 times more likely to become the president of an American industry than is the graduate of a liberal arts or similar institution, makes pertinent a few figures gathered by E. L. Thorndike and B. P. Beckwith of Columbia University from Security Exchange Commission reports on salaries paid





to chief officers of corporations. Such salaries in the automotive and airplane field ranged from \$26,000 to \$144,000; in the chemical and drug field, which paid about one-fifth more than the general run of businesses, from \$16,000 to \$375,000; in rails and transit companies, from \$18,000 to \$66,000 per year.

The bureau's report shed more light on the value of a technical training when it disclosed that those with a formal technical training did receive a higher income, on the average, than those without, and that the difference became more marked with advancing years. Nevertheless, the upper level of earnings for nongraduates was so far above the lower level for graduates that the inadequacy of a degree as a guarantee of a satisfactory income was obvious. "By and large," the report stated, "the value of a man's engineering services after 30 years or more of experience must be primarily his native capacity and the training he received in his various jobs." But the report also declares that for a number of years a college education has been thought of as a normal prerequisite to engineering work, and that many large employers of engineers are deliberately differentiating between college graduates and nongraduates in offering opportunities for training. The advantages in status which formerly accrued merely from the fact of college graduation are now being reserved for those who are graduated with exceptional standing.

But be that as it may, the figures show that engineers as a class are getting their share of Greek credit — cash.

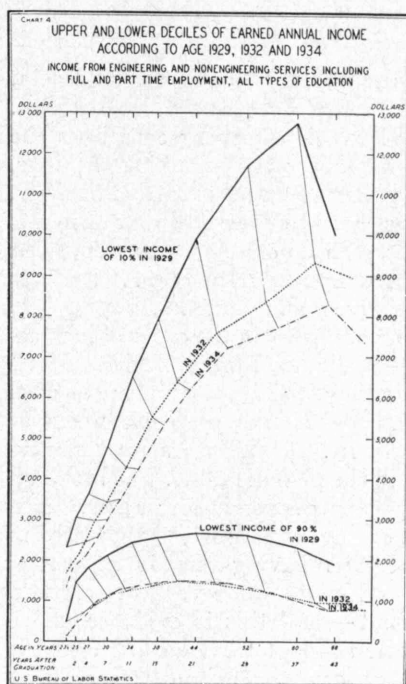
### Eek's Teeth

ESKIMO children of Eek, a community in the Kuskokwim district of Alaska, suffer a fairly large amount of dental decay. Youthful Eskimos of Kepnuk, in the same district, suffer very little. Kepnuk's younger generation is fed upon the traditional Eskimo fare —

fish, meat, fat, with some berries and greens in the summer — a diet low in carbohydrates. The rising generation of Eek, however, ekes out this diet with the addition of flour and sugar, which replace parts of the ancestral menu. But Eek's greater tooth trouble must not be attributed to the flour and sugar alone, for in an orphanage in the district, Eskimo children who ate even more flour and sugar had better teeth than those of Eek. The children of Eek delight in hard crackers, known variously as pilot biscuit, pilot bread, hardtack, and it is to the fact that they eat much of these that their dental difficulties must be attributed.

To this conclusion Dr. Theodore Rosebury of the Columbia University College of Physicians and Surgeons came as the result of studies made during an expedition into the Kuskokwim area in 1936. The amounts of pilot bread and of sugar used in the three centers — Kepnuk, the orphanage, and Eek — correlated with the amounts of caries or decay. No other food tallied thus. This conclusion is part of a hypothesis of tooth decay which Dr. Rosebury and Dr. Maxwell Karshan, the latter of the Columbia Dental School, have advanced on the basis of eight years' study of rats, in addition to the clinical studies of the Eskimos. Coarse, compressed starchy or sweet foods may lead to caries, according to their theory, which holds also that, contrary to popular beliefs, soft foods are not necessarily injurious to teeth. The hard crackers contribute to decay because, when they are bitten, fine particles are crammed into the fissures of the teeth and remain to ferment and produce acids which attack the teeth. Other hard foods which are not so compact, such as toast, crumble without packing when they are bitten and, consequently, are not injurious.

Studies of rats have shown that Vitamin D cuts down decay when it is added to the diet, that sugar increases decay, and that coarse raw cereal will induce decay



### INCOME IN THE ENGINEERING PROFESSION

At the request of the American Engineering Council, the Bureau of Labor Statistics has surveyed the engineering profession and published five reports on educational qualifications and unemployment, security of employment (see *The Review* for January, page 120), and other topics. The report on earnings, from which the adjacent charts were taken, is summarized on pages 161 and 162

even under the best dietary conditions. Tests with human beings — some following diets excluding the hard, compact carbohydrates; others, diets lavish in these constituents; and others, the average diet — are regarded by the investigators as essential before the theory can be finally accepted.

### Versatile Muck

**A**BOUT the most versatile mud in the world is that made by mixing bentonite clay with water. The solid factor in this mud may have been used in a soap mixture to make your wineglass sparkle, and is often used to settle the wine which fills the glass. Then, if dinner has disagreed with you, and your inward activities have to be x-rayed, bentonite may be used as a vehicle to carry through your alimentary system the barium sulphate which will be photographed. Likewise, unconsciously following the precept of the Indians, who used bentonite as a soap, the beauty addict may have her face packed with a clay in which bentonite is an important element, and then may treat a blemish with salve that bentonite has thickened.

Bentonite derives its name from the Fort Benton shales of the Upper Missouri Valley. Product of the weathering of volcanic glass, it appears in minute percentages in all soils and is found also in large deposits, of which several are in the United States.

At an extreme from these personal uses of the obliging mud are mechanical, industrial, and agricultural applications of bentonite. The simplest of these was the utilization of a bentonite mud to grease the axles of wagons, a method which the pioneers of American westward colonization were said to have practiced.

In our own more complex industrial days, bentonite mud is of unusual value in quickly remedying defects in concrete construction, being used to plug cracks in dams

when nothing else works. Similarly, an injection of bentonite mud pumped into an oil well will seep into and plug horizontal seams cut by the well hole, preventing caving of walls and the infiltration of water into the well. A current of thin bentonite mud, pumped down the inner tube of an oil-well casing during the process of drilling, is used to flush out the cuttings of the drill, bringing them back to the surface through the outer casing. Of course, if the viscous properties of the mud thus used in drilling are not exactly right, trouble results: The mud settles in a mass at the bottom of the cut, or it flows back to the surface but leaves the cuttings behind it. For this reason, study of the viscous properties of muds is a problem of considerable importance, a fact which brings us to the story of the investigation of bentonite now going on at Technology.

The property of bentonite clay which gives it the especial versatility that has been exploited in so many ways is the fact that it swells in water. Not all clays have this property, and few have it to the degree of bentonite. Kaolin, for instance, a clay of major ceramic importance, swells to an extent less by an order of magnitude than the swelling exhibited by bentonite.

Since this ability to swell is fundamental to the many important uses of bentonite, knowledge of the mechanism of controlling it is desired. This is the aim of the study which Professors Warren K. Lewis, '05, and Ernst A. Hauser, Dr. Charles E. Reed, '37, and Geoffrey Broughton, '36, of the Department of Chemical Engineering have undertaken at the Institute. They are seeking knowledge of the structure and the flow properties of the clay. The samples being used in Technology's research come from a deposit in Wyoming which exhibits the unusual swelling property to a marked degree.

Particles of bentonite consist of layers of crystallites, which are themselves platelike layers of silicon and aluminum atoms bound together with oxygen bridges. In dry particles these layers are stacked upon one another quite closely. When water is added, the water molecules, entering between the crystallites, force them apart and thus cause the swelling of the particle. The problem is one of colloid chemistry, for the investigators are concerned primarily with particles in the submicroscopic or colloidal range. These smallest particles are the main causes of the swelling tendency of bentonite, and consequently are of main importance in the study of structure. Since they possess a greater amount of surface in proportion to weight, they are also of prime importance in the study of flow properties, for, when split apart by water, they offer more opportunities for collisions with each other, with consequent interference with flow. The size of particles, therefore, is a material consideration in the study of viscosity.

Whirling samples of bentonite in a centrifuge at the rate of 25,000 revolutions per minute, the Institute investigators have broken them into fractions and, by successive fractionations, have settled out the finest material. This, so fine that it shows no evidence of sedimentation but stands indefinitely in solution in the ordinary gravitational field, must be worked on by a force of 15,000 times gravity if it is to be settled out. The finest fractions thus secured then serve as the basis of study by x-rays and other means.



### *Element No. 87 Discovered Again*

**E**LEMENT 87 has apparently been discovered again, this time by a French scientist, Horia Hulubei. From one point of view this discovery completes the list of the elements which, from the beginning of things, have been waiting for man to find them; from another, it serves to remind us that there are still four elements in the periodic table which no one has ever seen, their existence being inferred merely from observed effects attributable to extremely small quantities.

If all of the elements are listed in the order of increasing atomic weights — hydrogen, helium, lithium, beryllium, and so on to uranium, the heaviest of the natural elements — it appears that similar properties recur at regular intervals in the list. Mendelyev's great discovery was summarized in the periodic table. The list of all the elements was divided into several shorter lists. When these were set down, one under another, or tabulated in horizontal lines, elements having similar properties were found to be listed in the same vertical columns. But Mendelyev found — and this is evidence of his genius — that, in order to meet the condition that the elements listed in the same vertical columns should have similar properties, it was necessary to leave certain gaps in the table. In other words, it was necessary to construct the table as if certain elements existed. Mendelyev, in 1869, predicted the atomic weights and properties of a number of these elements, and they have since been discovered, confirming his prediction.

In 1913-1914, H. G. J. Moseley studied the x-ray emission spectra of the elements and observed certain regularities in the wavelengths of the principal lines, which were attributable to the regularly increasing complexity of structure of atoms of increasing atomic weight. He gave atomic numbers to the elements, numbering hydrogen as 1, helium 2, lithium 3, beryllium 4, and so on to uranium 92. All of the elements of Mendelyev's tables, whether known or unknown, were numbered. The vacancies were confirmed as vacancies; the puzzling group of the rare earths was put in order; gaps in the known series were made clear. All elements between hydrogen 1 and uranium 92 are now more or less perfectly known. Since the discovery of isotopes — that is, of portions of the same elements which differ in atomic weight but have the same chemical properties — the atomic number of an element is regarded as a more fundamental property than its atomic weight.

Elements numbered 61, illinium, 43, masurium, 85, alabamine, and 87, virginium — or madavium as Hulubei has named it — have in some sense been discovered. They are known by some evidence or other, though not by any which is sufficient to make us acquainted with their ordinary physical properties, such as density and color and appearance. Their histories lack the fine dramatic and unequivocal characters of the histories of oxygen and of radium. Beyond uranium 92, a number of "transuranic" elements have been produced by bombarding heavy atoms with neutrons which stick to them and make them heavier. The resulting radioactive superelements are such that we may say of them that they have been prepared but not that they have been discovered.



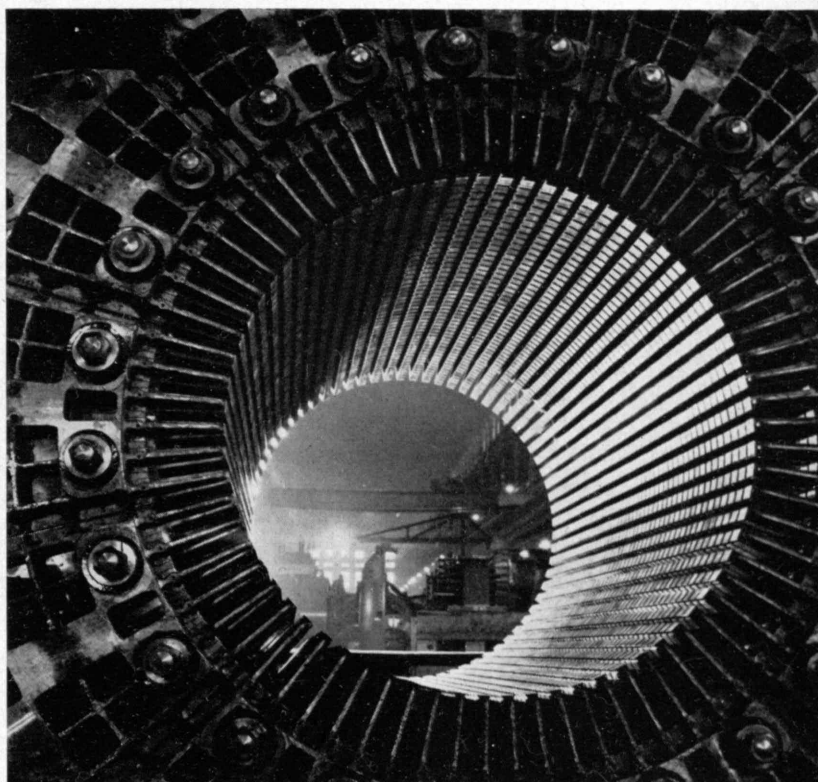
*City Lights by Paul J. Woolf*

Element 61, illinium, was discovered in 1926 by Professor B. S. Hopkins of the University of Illinois and Dr. L. F. Yntema, who made a spectrographic examination of the bromates fractionated from monazite sand. The expected lines in the absorption spectrum were found and also the x-ray spectrum which was predicted from Moseley's rule. After Hopkins had announced the discovery and had named the element, certain double magnesium nitrates, which Professor Charles James of the University of New Hampshire had been fractionating in search of the same element, were examined and found to show the same lines. Professor Luigi Rolla of the Royal University of Florence also discovered the element; he named it florentium. He worked with the assistance of Miss Rita Brunetti, also a Professor at Florence, who made the spectroscopic examination of the double thallium sulphates which he fractionated from monazite sand. The results obtained in 1924 were not published until 1926.

The discovery of two new elements of the manganese group, numbers 43 and 75, was announced in June, 1925, by three Berlin chemists — Drs. Walter Noddack and Ida Tacke (subsequently Frau Noddack), who fractionated material from the mineral, columbite, and Dr. Otto Berg, who examined the material with the x-ray spectrograph. They named the elements masurium (43) and rhenium (75) in memory of two provinces which Germany lost by the World War. Rhenium has since been studied extensively and has come into commerce, but no further information about masurium has been published.

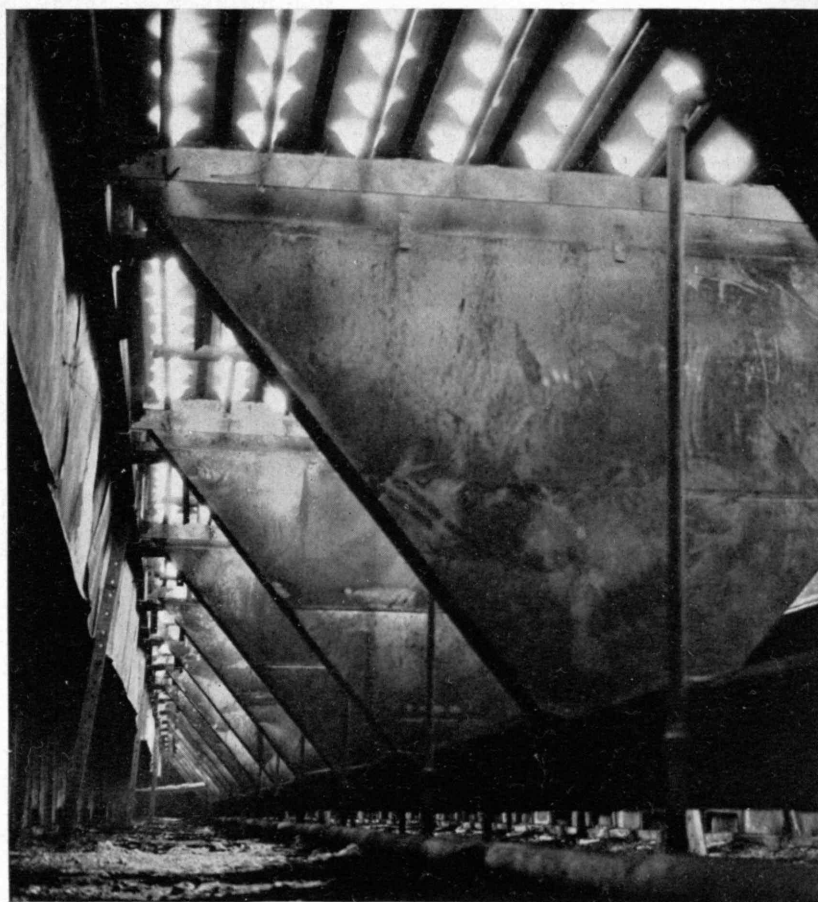
Between 1927 and 1930, Dr. Fred Allison of the physics department of the Alabama Polytechnic Institute worked out a magnetoöptic method of analysis. He found that, when a beam of monochromatic polarized light is passed through a transparent solution of the chemical compound which is subjected at the same time to the action of a magnetic field, there appear one or more minima of light intensity after a time lag of about a billionth of a second. From the study of many compounds, Allison and Murphy concluded that the time lag is an inverse function of the chemical equivalent of the ion. In the fall of 1929 they examined specimens of lepidolite and pollucite — lithium minerals which contain cesium and which might be expected to contain small amounts of the new alkali metal, element 87, which falls below cesium in the vertical column of the periodic table — and found minima at the points which corresponded to that element. Allison proposed for it the name of virginium, after his native state. Allison and Murphy, with the assistance of Professor Edna R. Bishop and Miss Anna L. Sommer, later worked on material from monazite sand and in May, 1931, announced the discovery, by the magnetoöptic method, of the new halogen, element 85, which falls below iodine in the vertical column of the periodic table. This they named alabamine, in memory of the place of its discovery.

Virginium, the element recently reported as rediscovered, has had already a considerable history. In October, 1931, Professor Jacob Papish and Eugene Wainer of the chemistry department of Cornell University obtained spectroscopic evidence of its existence.



*Courtesy Allis-Chalmers "Electrical Review"*

Above. Through the stator of a 30,000 kilowatt turbogenerator unit  
Below. Furnaces burning the natural gas of the Texas Panhandle to produce carbon black, the soot used in printers' ink and in rubber to make tougher tires



*Charles Phelps Cushing*



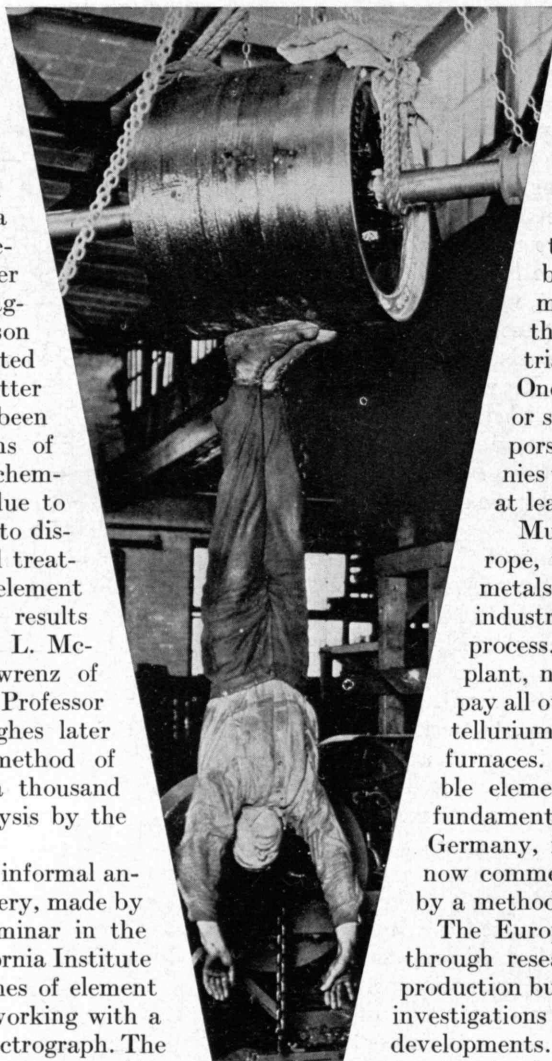
They sought for it in a specimen of samarskite rich in uranium and its disintegration products and containing rubidium and cesium. The least soluble of the aluminum alums fractionated from this material showed in their x-ray spectra the lines predicted from Moseley's rule. Papish and Wainer were not able to confirm the magnetoöptic observations of Allison and his co-workers, and suggested that the minima which the latter observed might perhaps have been caused by certain complex ions of tin and rhenium. The Alabama chemists showed that the minima due to the complex ions may be made to disappear by appropriate chemical treatment, while the minima due to element 87 remain undisturbed. These results were confirmed by Professor J. L. McGhee and Miss Margaret Lawrenz of Emory University in Georgia. Professor Hopkins and Dr. Gordon Hughes later examined the magnetoöptic method of analysis and found it to be a thousand times more sensitive than analysis by the arc spectrum.

According to the offhand and informal announcement of Hulubei's discovery, made by Dr. F. R. Hirsh, Jr., at a seminar in the physics department of the California Institute of Technology, he found the lines of element 87 in material from pollucite, working with a curved crystal focusing x-ray spectrograph. The instrument is one which was first suggested by Dr. DuMond of the California Institute of Technology and was modified by the French scientist, Cauchois. It is said to be capable of detecting one part of an element in 10,000,000,000 parts of material — one in ten billion, as we would say; one in ten thousand million, as they reckon things in France.

### Profits from Waste

**D**ESPITE important advances in methods of manufacture in recent years, American industry, as a whole, continues to waste its raw materials at a rate which astonishes the European industrialist, who by necessity must conserve limited natural resources by every possible means. These industrialists look hungrily at our industrial waste dumps and gaze enviously at the smoke and vapors that rise from American industrial stacks, dissipating in the air fortunes in valuable substances.

Following the World War, Germany reworked the great dumps of her iron and steel plants in the Ruhr and later, because of the value of iron in that country, even found it economical to buy foreign slag dumps, ship the material to Germany, and process it for substances, the recovery of which unremitting research has made possible.



*This magnet pulley, designed for an ore separator, lifts a man by the nails of his shoes*

*Dings Magnetic Separator Co.*

Even coal from coke is recovered by utilizing the basic principles of ore flotation, a method originally developed in the United States. Methods have been developed in France and Germany by which a high percentage of the organic solvents used in industrial processes may be recovered. One such method employs charcoal or silica gel for filtering industrial vapors; the apparatus which accompanies this is installed with a guarantee of at least 90 per cent recovery.

Much attention is devoted, in Europe, to the recovery of chemicals and metals from the smoke and fumes of industrial furnaces by the Lodge-Cottrell process. One large Russian phosphate plant, near the Black Sea, is reported to pay all overhead charges from the profits of tellurium recovered from the smoke of its furnaces. The method by which this valuable element is recovered is the result of fundamental research in colloidal processes. Germany, in seeking new sources of fats, is now commercially producing soap from coal by a method based on hydrogenation.

The European industrialist not only seeks through research to increase the efficiency of production but carries on fundamental scientific investigations from which have come interesting developments. He not only conserves his raw materials in the process of common application but constantly seeks new applications, new by-product materials for new uses. Italian scientists, profiting by the fundamental substances in protein chemistry, developed a new textile fiber from casein, the principal protein of milk, which once was considered of no value. The new fiber (it has incorrectly been called wool) is not unlike rayon in appearance but differs fundamentally in that it has a nitrogen instead of a cellulose base. Development of this new fiber has reached the stage of commercial production.

Unlike the industrialists of the older countries, the American manufacturer, with a few notable exceptions, has not adequately realized the possibilities of pure research, the ultimate results of which, as President Compton stated at the recent meeting of the National Association of Manufacturers, are likely to be the most important.

### En Voiture

**N**OT so long ago a few of the nation's railways were timidly trying out a scant baker's dozen of new, shiny two- and three-car articulated and streamline Diesel train units. Comment upon the venture appearing in *The Review* for February, 1935 (page 170), although

*Black Lightning? Here is a fine example of this interesting photographic phenomenon. The bolt stripped a tree in Central Park, New York City*

*Charles Phelps Cushing*

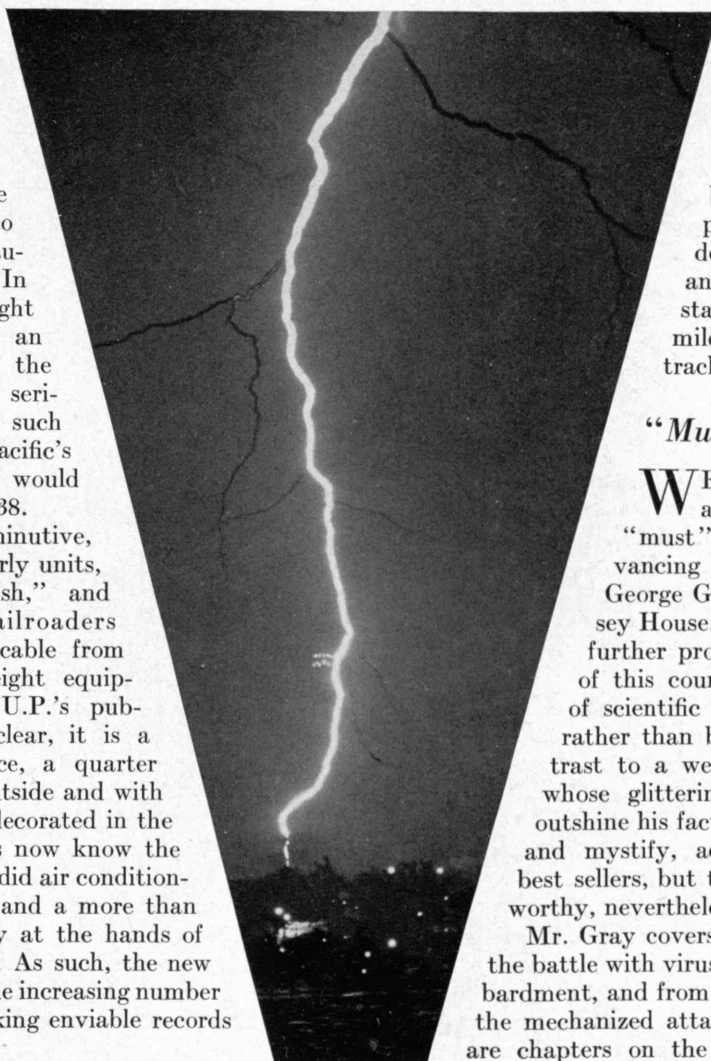
written from a favorable viewpoint, now seems to read as if it had been cautiously worded indeed. In defense, however, we might reasonably submit that an unbridled enthusiast of the early Diesels could not seriously have foreseen that such a train as the Union Pacific's new *City of Los Angeles* would take its bow along with 1938.

This train is no diminutive, cramped affair like the early units, cynically dubbed "tinfish," and worse, by hardened railroaders whose ideas were inextricable from standard-sized, heavy-weight equipment. Instead, as the U.P.'s publicity has made amply clear, it is a roomy, 17-car conveyance, a quarter mile long, with a sleek outside and with its insides arranged and decorated in the manner which railroaders now know the public takes to heart as it did air conditioning, more bedroom cars, and a more than occasional bit of courtesy at the hands of train-operating personnel. As such, the new *City of Los Angeles* joins the increasing number of limiteds which are making enviable records for patronage.

Membership in this group is by no means restricted to the Diesels such as the Rock Island's half-dozen *Rockets* of 1937 vintage or those of the Denver-Chicago services of the Union Pacific and the Burlington. It also includes the Southern Pacific's new *Daylight*, the Milwaukee's *Hiawatha*, and the *Royal Blue* of the Baltimore and Ohio, all of which are steam operated. The success of these three testifies that fast and comfortable transportation is of more moment to a passenger than that he be hauled by an internal-combustion power plant.

It is to the credit of the proponents of the Diesel, however, that its advent inaugurated a new era, in which champions of the notions that revising the surroundings provided for the passenger and getting him to his destination quicker might wean traffic back to the rails, got a hearing.

Moreover, as the development of the Diesel for railroad motive power continues, it encourages corresponding advances in steam locomotive design. Thus, in the latest equipment for the *Royal Blue*, the locomotive has been given a semiwatertube firebox and has had its boiler pressure and tractive force increased. The B. & O. is also building a new type steam locomotive of 16 cylinders, arranged for constant torque propulsion, each of four driving axles being geared to a four-cylinder



Besler steam motor. The locomotive will have no counterbalancing, no side rods or crankpins, thus reducing track stresses. With a boiler pressure at 350 pounds, it is expected to develop 5,000 horsepower and be able to handle 14 standard Pullmans at 100 miles per hour on straight track.

### "Must" Reading

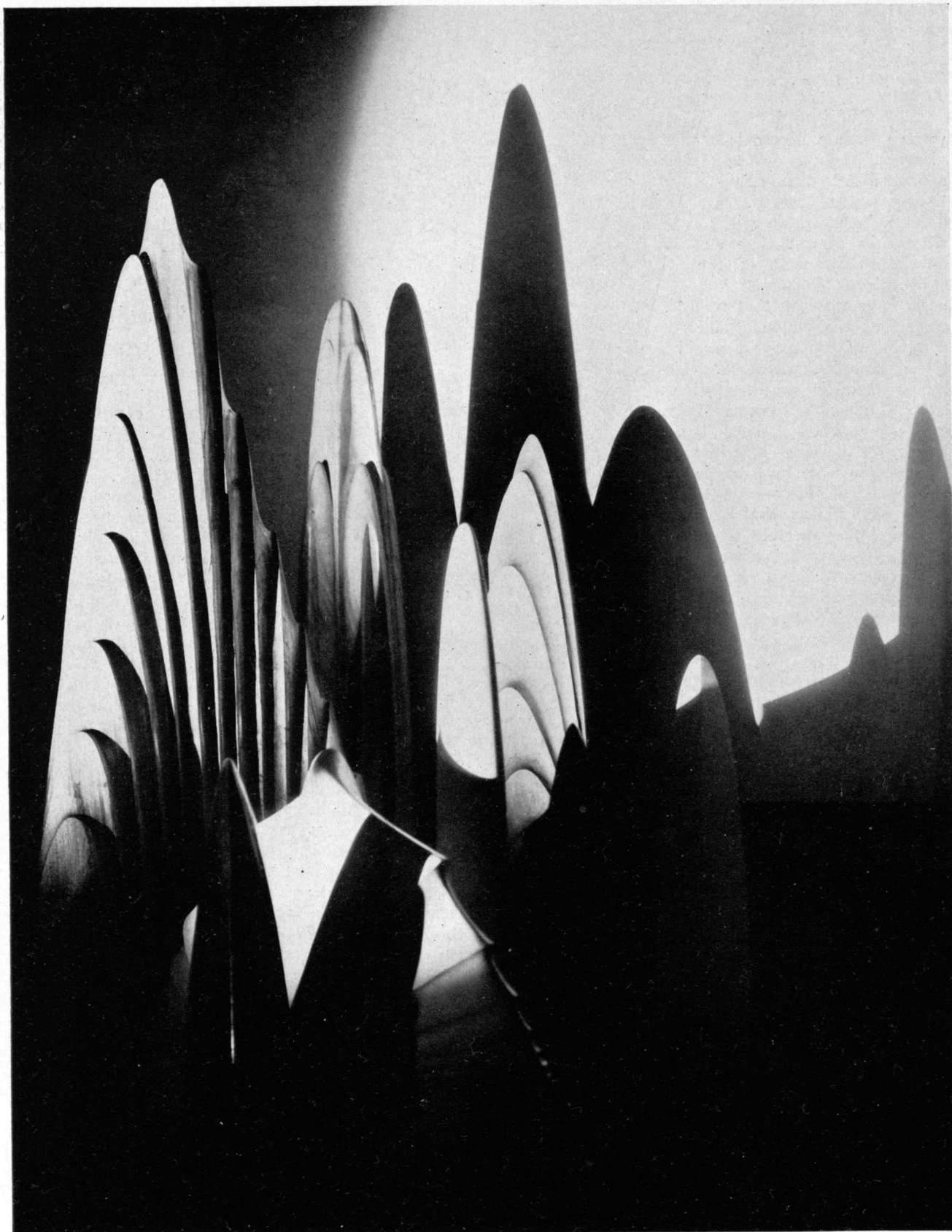
WE have finally gotten around to that item on our "must" reading list, "The Advancing Front of Science," by George Gray (New York; Whittlesey House. \$3.00). We find the book further proof that Mr. Gray is one of this country's sounder expositors of scientific news. His style is clear, rather than brilliant, in welcome contrast to a well-known English writer, whose glittering "explanations" often outshine his facts. Clarity may not excite and mystify, accuracy may not breed best sellers, but these qualities are praiseworthy, nevertheless.

Mr. Gray covers a very wide front: from the battle with virus diseases to nuclear bombardment, and from the retreating nebulae to the mechanized attack on psychology. There are chapters on the recent developments in astronomy, in acoustics, in cosmic rays, in chemistry, and in biology. These are uniformly up to date, containing reports on the discoveries of last winter and estimates of the importance of these discoveries. The estimates are sometimes overly optimistic, but the reporting is satisfactorily accurate. The book lacks the unity of Gray's earlier work, "New World Picture," due probably to the wider field covered, and perhaps due also to the fact that several chapters in the new work were written as magazine articles. "The Advancing Front of Science" is as good a job of reporting as could be expected from a writer not trained as a scientist.

This brings us to the questions already raised by our weirdly worded contemporary, *Time*: Why do scientists in this country shun the important task of reporting science to the layman? Why are there so few American Hoggens and Haldanes and Jeanses? Perhaps part of the answer is that our learned men have been elbowed out of public affairs by "practical" politicians and magnates for so long that by now they are persuaded they can do nothing directly for the enlightenment of the public.

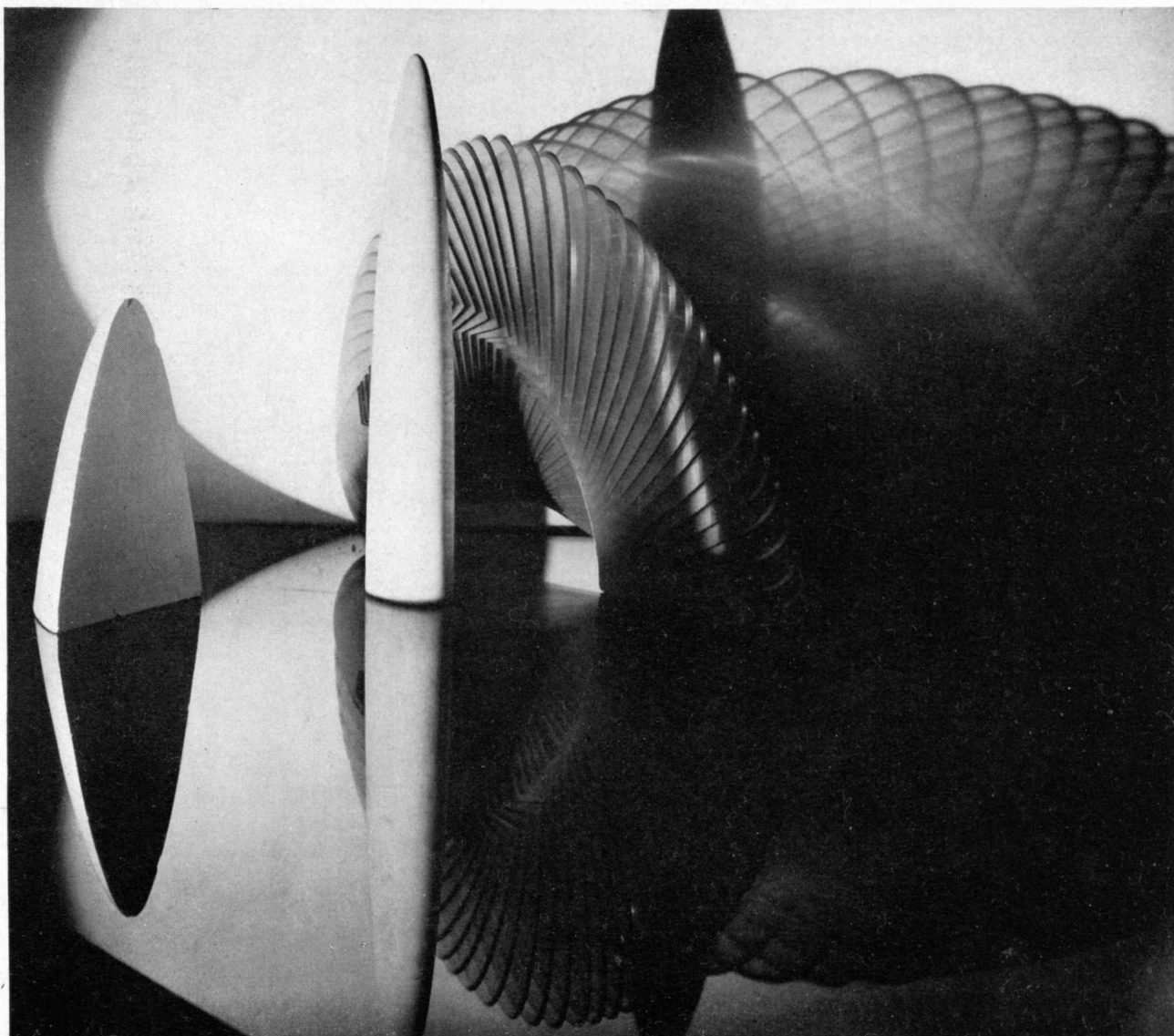
There are signs, however, that this dangerous and unhealthy attitude is vanishing, particularly in the field of biology. But until we scientists and engineers realize that part of our task is to keep the lay public informed of our work, we should encourage writers like George Gray.





#### ACTORS

*Above and on the following three pages are shown some of the 20-odd designs which are the actors, animated by hand, in an abstract cinema, "Parabola," designed and directed by Mr. Boyd. On the cover of this issue are other form themes in three dimensions*



BEYOND THE POWER OF WORDS

*. . . these abstract shapes bear silent testimony to the virtue of order in design*

# The Shape of Things to Come

*Design, the Link between Science and Art*

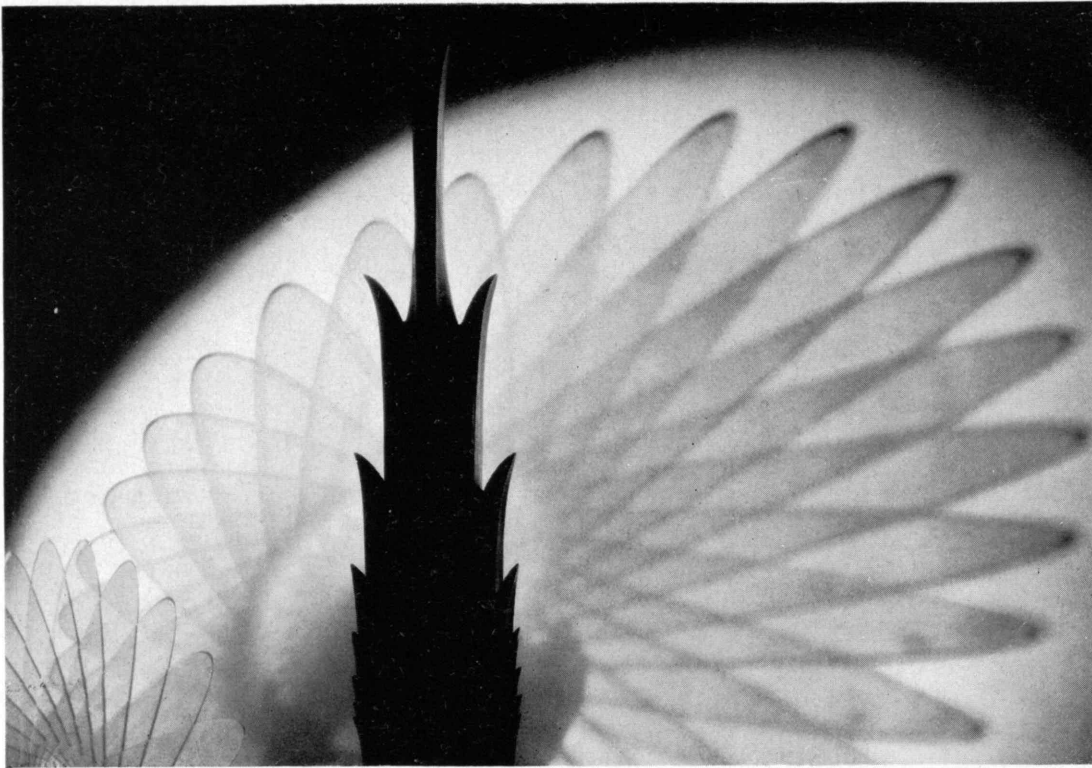
BY RUTHERFORD BOYD

**T**HERE is a cleavage in human culture that separates science and art. Throughout recent centuries this cleavage widened with every contribution to culture and every development in education. Yet whatever hypothesis in science seems at the moment most plausible, whatever movement in art seems most sophisticated, we are always profoundly conscious of that fundamental principle, order, that is manifested in the arts as design. The cleavage between art and science

will disappear as this vital principle unifies our collective human experiences. This greater concept of design has a validity beyond any wishful sentiment, a fact which becomes increasingly evident as we understand the gradual development of design.

When prehistoric man began to plan and design, he imitated certain forms in nature that served his primitive needs for food, shelter, and survival. He learned slowly, by trial and error, to adapt and develop his crude





#### THESE AB- STRACTIONS

*... are entirely  
schematic and are  
controlled by sim-  
ple mathematical  
concepts*

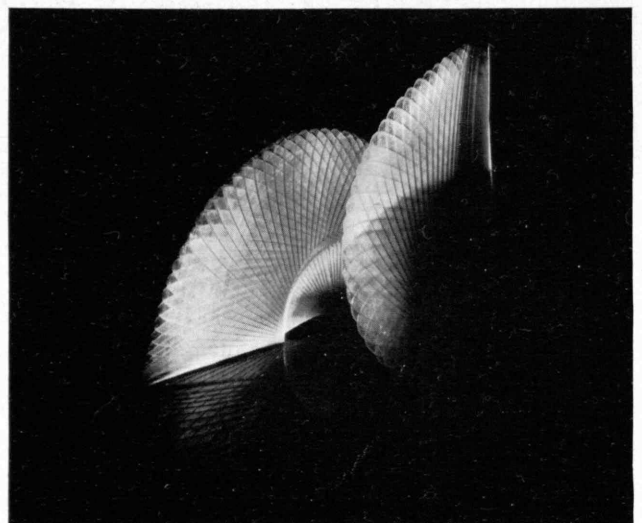
imitations of these natural forms into implements of peace and war that survive today as mute evidence of the first functional designs. Undoubtedly our heritage in design stems from these two original sources: first, the natural forms — minerals, plants, animals, and man, himself — all the variety of forms functioning in nature; and second, the new forms created by man's adaptation of natural forms to his human functions. Only recently have we recognized the third source of form in design, that is, the conception of abstract or pure form, which is the ultimate method for comparing and defining and inventing new basic forms.

Through the historical perspective of architectural design we may trace the cycles of style in their rise, climax, and decadence — each cycle clinging to certain prototypes from earlier traditions. But in this mechanized century of ours the cycles of style no longer repeat themselves; our economic and cultural changes are accelerated as we evolve new materials and new processes that dominate design in the present era. In our craving for sensational novelty we commit abortive and ephemeral crimes in the arts. If we are to create a "brave new world," we must restate, in the idioms of today, the vital principles of design and embody them in our new technology.

This concept of architectonic form will be one that includes post, lintel, and arch, all the basic forms of tradition, and the modern functional and abstract forms. Many of these abstract shapes have been seldom, if ever, used structurally in the arts; our ignorance of their form characteristics leads to hasty makeshifts and compromises in design. We must return to the true source of our knowledge of abstract form, but merely to mention mathematics arouses distrust and antagonism among

the artists who recall those recent panaceas that claimed to cure all bad taste in art and those various systems that would automatically evolve fine design.

Putting aside all prejudice the artist-designer must understand the significance to him of this great language of form. The Egyptians carried their "earth measure," or geometry, only as far as necessity demanded, but the Greeks, with their speculative tendencies, developed and studied pure form relations, never dreaming that these curves and shapes would be of practical value. No wonder music was then a branch of mathematics; there were perhaps some diagrams drawn upon the sand, a leisurely argument, and time for meditation. For the designer, there remain concealed in the





postulates and axioms of Euclid the basic principles of abstract form and its great qualities of rhythm, symmetry, and proportion. Today we must translate these strange symbols and difficult equations into clear statements of absolute form, into actual shapes that will convince the designer of their significance and power.

Among the abstract forms of the ancients is the parabola, more familiar today to the scientist than to the artist. This unique curve is one of the celebrated conic sections which were invented by an associate of Plato about 400 B.C. Two centuries later it was discovered that the conics could be evolved by passing a plane through a single cone. Over 500 years later, the last great mathematician of the Alexandrians, Pappus, defined the conics as the loci of those points whose dis-

tances from a fixed point, the focus, and from a fixed line, the directrix, are in a constant ratio. Only a fragmentary knowledge of the conics was current in Europe until the 16th Century, when much of it was rediscovered through an earlier Arabic translation, a thousand years after the Greek invention of these abstract shapes.

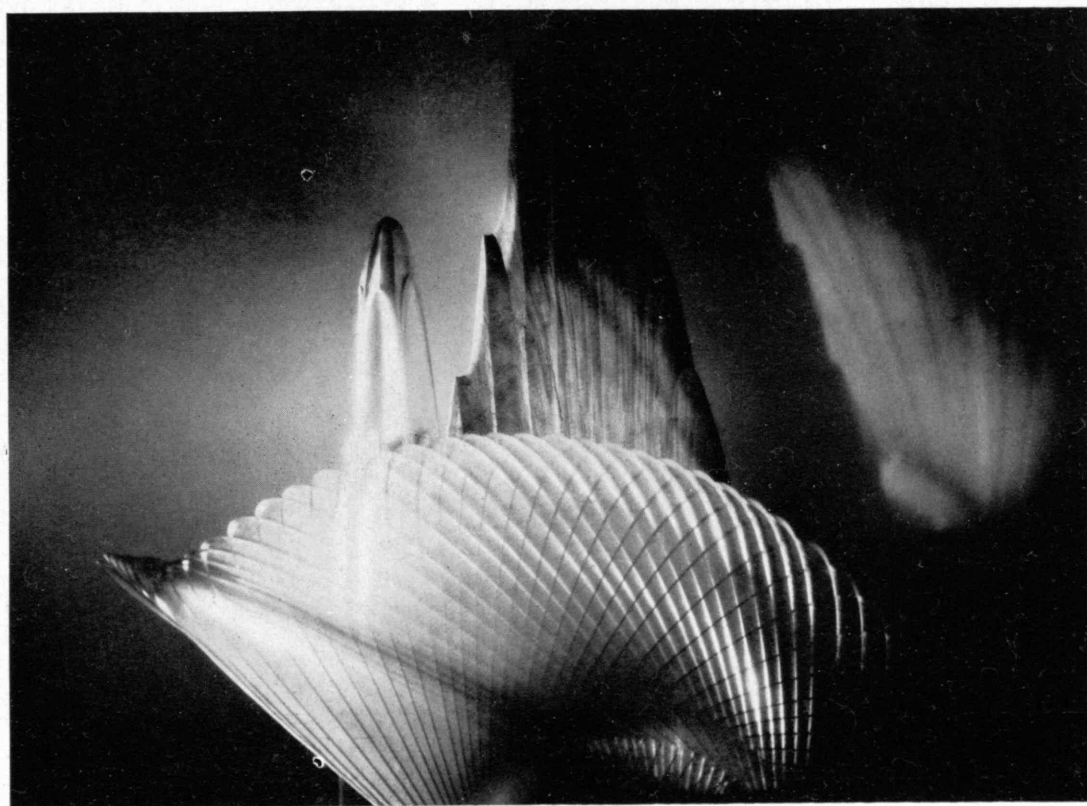
These curves were studied by the contemporaries of Phidias and Ictinus, but so far as we know they were not consciously used in Greek art; so we can realize how new much of this source material is to design. The parabola, generally unknown to designers prior to our century, has been evolved in our laboratory of design into many tridimensional forms, all various combinations and developments of this unique curve, whose structural identity must be drawn or carved to be really appreciated.

All the abstractions illustrated are entirely schematic and are controlled by some simple mathematical concepts. However, we perceive that within the formal limitations of these abstract concepts, our future inventions in applied design will be controlled largely by their function. It is evident that many of the possible variations in abstract design themes may be quite inappropriate and will certainly be "ugly." That domain of our collective good taste and of individual discriminations will, of course, survive in this new orientation in design, although this type of absolute form is distinct from the imitative, the picturesque, and the inspirational.

Probably we cannot consciously create a new style; certainly that miracle will not occur until this new concept is integrated into common practice in the arts. Beyond the power of words, however, these abstract shapes bear silent testimony to the power of order, of pure design, that links together the sciences and the arts.

#### INVENTION

*... of new design forms will be aided by an appreciation of pure form, by an understanding of the relation between science and the arts*





# Rubber and Life

## *How Microscopic Studies of Rubber May Lead to a Better Understanding of Living Processes*

BY GEORGE W. GRAY

AT last September's meeting of the American Chemical Society two scientists of the Bell Telephone Laboratories presented reports of a joint research in rubber. The telephone industry buys hundreds of tons of rubber each year for use in insulation and in other ways. Any added knowledge of the nature, structure, and behavior of this basic material may be useful in improving its quality, increasing the longevity of its service, or opening new opportunities for its application; hence the enormous commercial interest in rubber research. And yet, as it may turn out, the significance of the work that F. F. Lucas, microscopist, and A. R. Kemp, chemist, reported last fall may reach beyond industry, beyond the chemistry and physics of rubber, into the vaster, more profound, and more intimately human field of fundamental biology — the chemistry and physics of life itself.

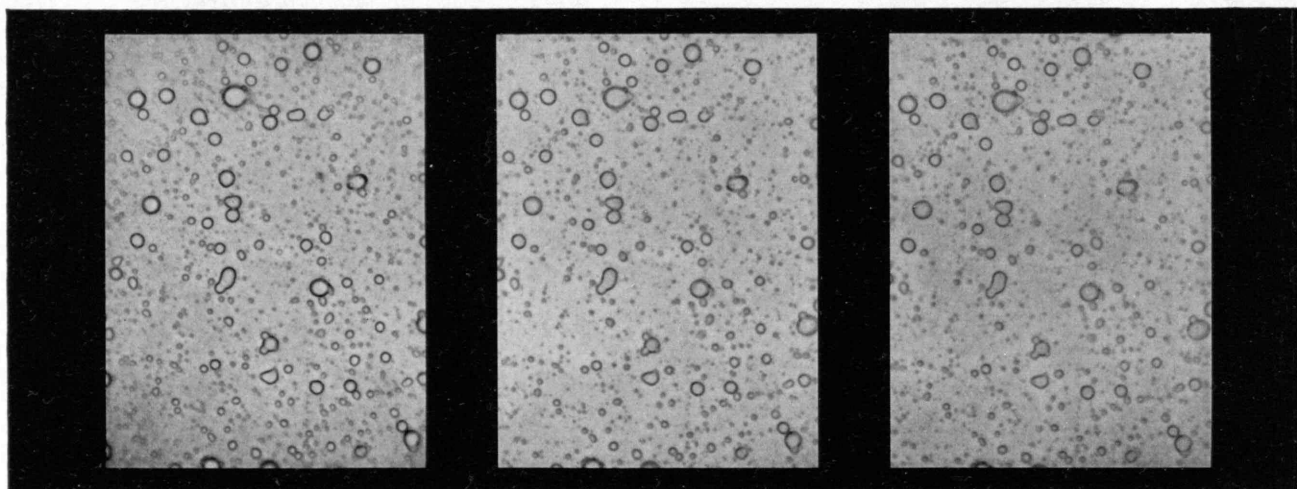
Dr. Lucas' specialty is the microscope. His interest in this optical tool began quite casually in 1912 when he was a young man in New York, in charge of inspection of timber for the Western Electric Company. There was an apparently irreducible percentage of bad timber that got by, despite expert testing. It was in an effort to detect these failures in advance that Lucas one day invested some of his savings in a small microscope. He began his microscopic examination of wood samples in his home, working Saturdays and evenings on his own time; but soon he was discovering hidden flaws and finding such direct clues to wood weakness and wood strength that the instrument was moved to the office and became an accepted device of the division of inspection. Meanwhile, Lucas found his microscope becoming an



### SEEING THE INVISIBLE

*Dr. Francis F. Lucas and the ultraviolet microscope. With the better resolution possible with this instrument, it is practical to record images of things 6,000 times smaller than the unaided eye can see*

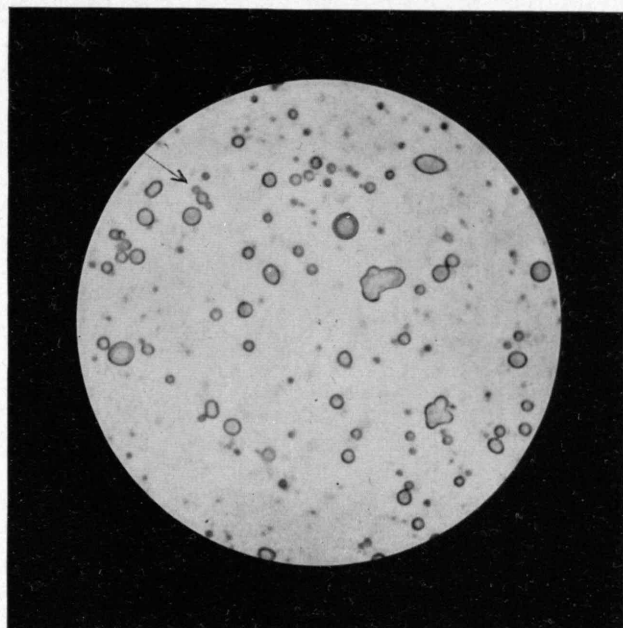
absorbing hobby. All the time he could get from business duties and other routine was given to it, and presently his employers recognized the scientific bent of their supervisor of inspectors. Eventually he was transferred to the laboratory. He was placed in charge of microscopy. He was supplied with more powerful instruments and other facilities. He pushed into studies of fibers, of plastics, of metals. He found ways to employ devices which others had been unable to use successfully.



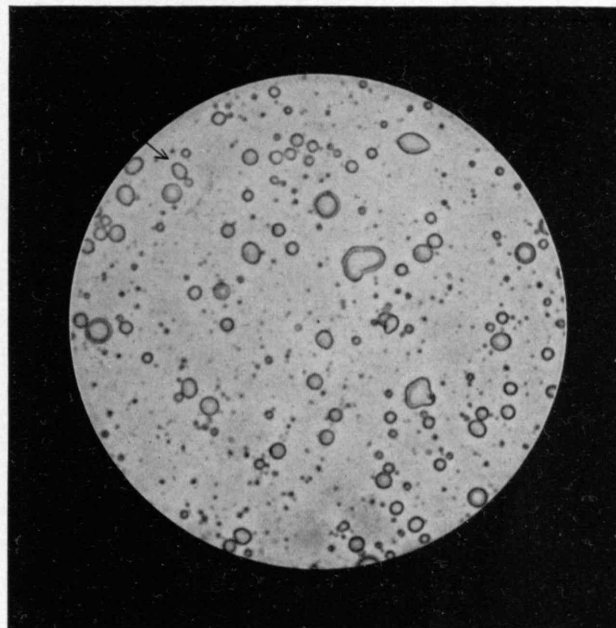
### RUBBER IS COLLOIDAL

*Here is how rubber latex looks at 1800-X in three successive layers spaced 1/100,000 of an inch apart*

*Francis F. Lucas*



A



B

Francis F. Lucas

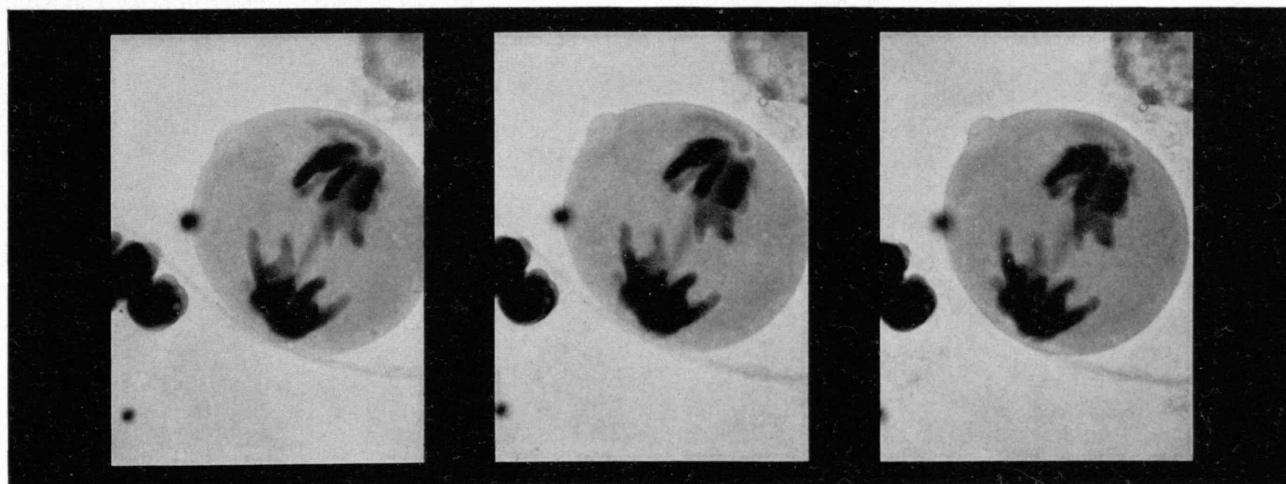
## THE MOTES MERGE

*Strange changes occur in latex. In A there are about 140 particles in the field. Fifteen minutes later the same illuminating beam discloses between 500 and 600 particles in the same field. The diameter of the average particle in A is 0.608 micron; in B, 0.368. Note three particles in A which, in B, have formed two particles*

For example, there was a lens arrangement which had been devised in Germany, back in 1886, by Ernst Abbe. Lucas achieved in practice the utmost resolution of which this system was capable. In studies of metal surfaces he stepped magnifications from a few hundred diameters upward to 3,500 diameters, and he photographed crisp, brilliant images revealing, under favorable conditions, particles of matter as small as 500 atoms across. There was also an invention, in 1889, of another lens designed by Abbe — a very remarkable arrangement which, it could be proved mathematically, possesses the highest resolving power of any possible lens. Because of certain limitations this device had never been used successfully; it had lain dormant for more than a quarter of a century, but to further Lucas'

metallographic studies the Zeiss works now revived the later lens system and installed it in a specially designed microscope. With this apparatus Lucas found it possible to step up his magnification to dimensions well above 4,000 diameters and to increase resolution so considerably that he photographed minute details of metal structure scarcely more than 150 atom diameters.

Theory said he would never be able to go higher with visible light. Then why not try the invisible ultraviolet? Here, because the wavelengths are shorter, smaller objects should be revealed; and since photographic emulsions are sensitive to ultraviolet, there should be no difficulty in photographing the invisible images. Again Lucas found that an inventor had anticipated him. The German physicist, A. Köhler, had built an ultra-

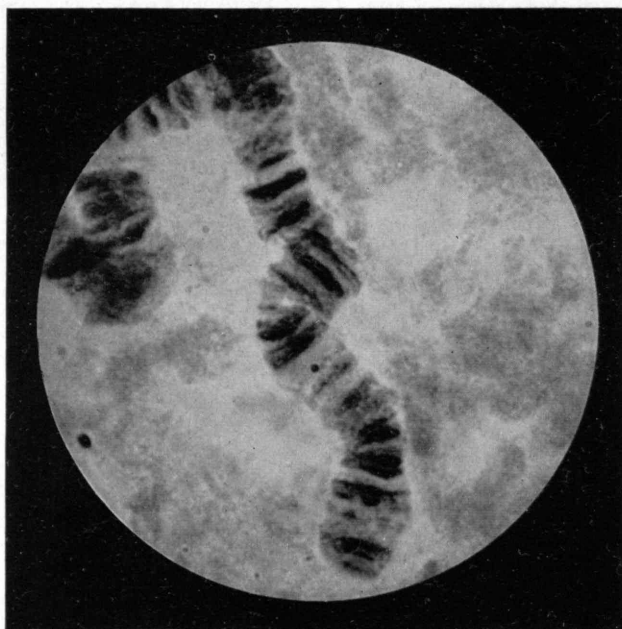


Francis F. Lucas

## LIVING CELLS ARE COLLOIDAL

*Remarkable photographs (1200-X) of living cells, showing the dividing nucleus, sharp and clear, in three optical sections*





Francis F. Lucas with Mary B. Stark

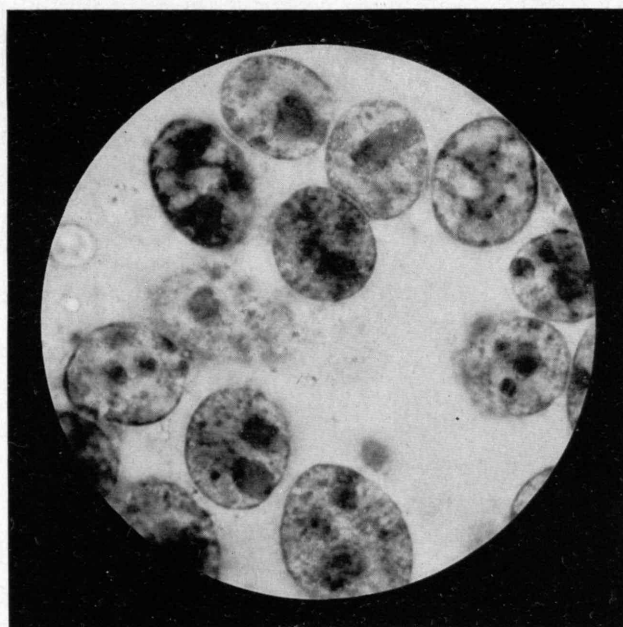
*Chromosomes of the salivary glands of fruit fly larvae*

violet microscope in 1900. About one hundred instruments of this new type had been constructed at the Zeiss works and sold to laboratories in various parts of the world. But, again, none of the purchasers had been able to make practical use of the apparatus. The results had been so generally discouraging that when Lucas applied to the manufacturers to purchase an ultraviolet microscope, they were reluctant to sell it and warned him of the ill luck that others had had.

Technique is half the victory — and Lucas has an uncanny sense for technique. He studied the ultraviolet microscope for two years. He made a trip to Jena to consult the inventor. Various sources of the radiation were discussed and tried, new manipulations of the extremely sensitive focusing device, different wavelengths of ultraviolet — and out of these testings came a triumphant technique. It was not that the ultraviolet gave higher magnification but that it brought finer resolution.

By resolution is meant the sharpening of the image. There is a law of optics which says that as you decrease the wavelength of light used, you increase the resolving power. The wavelength used in the ultraviolet microscope is about half the wavelength of visible light used in the ordinary microscope. Therefore, a change from visible to ultraviolet microscopy means that the resolving power is multiplied by two. It was this multiplication of his resolving power that gave Lucas an immediate gain with his microscopy. And so he was able thus to increase magnification. Enlargements up to 3,600 became common, and under especially favorable conditions of illumination and photography Lucas found it possible to record images of things 6,000 times smaller than the unaided eye can see.

At the time he was developing this mastery of the ultraviolet instrument, the Bell Laboratories were concerned with studies of metals and magnetic alloys, and a prime objective of Lucas' work was to explore the



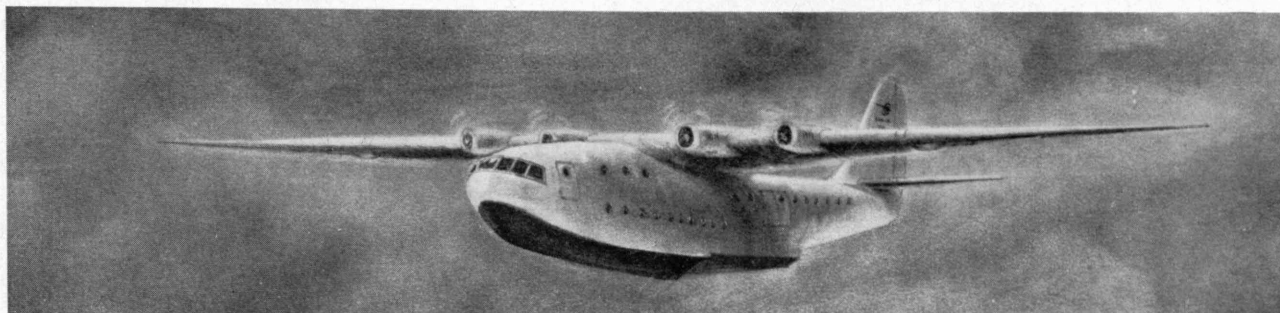
Francis F. Lucas

#### STUDIES OF LIVING CELLS

*Looking in on cancer. Experimental rodent carcinoma cells*

minute crystal structure of these materials. But when he turned the new microscope on a thin slab of iron or nickel, he found that the ultraviolet rays were absorbed. The molecules of the metal simply sucked in the energy of the rays, so that either none or too few were reflected to the photographic film, and a blank exposure was the result. By other means, with visible rays, Lucas had attained a marvelous microscopy of metals. Meanwhile, however, he had this tempting new ultraviolet equipment, begging to be used. He tried it on living tissue, on plant and animal cells, on the minute internal organs of cells — and behold! he could photograph them. These colloidal systems lent themselves beautifully to the invisible photography. There was a rapt interlude of two or three years when the telephone researcher lavished time and energy and skill on studies of the mysterious materials and mechanisms of life: the merging chromosomes, the dividing nucleus, the surrounding cytoplasm, which showed clear and sharp in the ultraviolet photographs.

Down the corridor from Lucas' battery of microscopes, and on a lower floor, is a laboratory of chemistry where Dr. Kemp works. One of the telephone materials with which Kemp and his staff are chronically concerned — mixing it, analyzing it, remixing it, again tearing it apart and testing it — is rubber. And rubber is a colloid. Since the living colloids of protoplasm had lent themselves so interestingly to the ultraviolet microscopy, why not try this ingenious photography on the inanimate colloid? About a year ago, Dr. Kemp obtained two fresh specimens of rubber latex, the caoutchouc sap from which our commercial product is derived. One gallon came from an American rubber company and represented a sampling of the blended sap of thousands of trees in Sumatra; the other from an English company whose trees grow in the Malay Peninsula. These were turned over to Dr. Lucas. (Continued on page 188)



IN 1940

*A future Sikorsky as it may wing its way over the Atlantic. The hull is 19 feet deep at the main step bulkhead, contains two decks*

## Big Boats Boom

*In Mold Lofts and on Drafting Boards Superliners for Ocean Air Routes Are Being Laid Down for Tomorrow's Service*

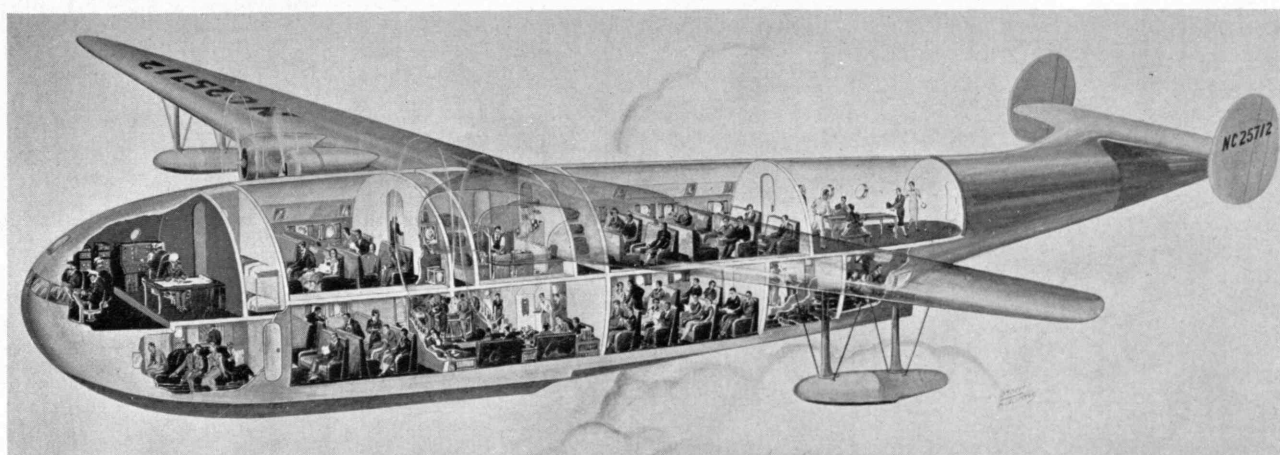
BY S. PAUL JOHNSTON

ALMOST twenty years ago, as a flying cadet in the then United States Army Air Service, the author and a group of other kaydets and flying officers stood practically bug-eyed before a Caproni bomber on old Hazelhurst Field (now Roosevelt Field in New York State). To us (still subconsciously surprised, perhaps, that such a contraption should fly at all) it was an awesome thing. And when it lumbered off the field with great tongues of flame streaking from the open exhausts of its three Liberties, we felt that we had been accorded a glimpse into the distant future.

Considerably less than ten years ago that box-kite Caproni, with its 70-odd foot span and its 1,100 horses, still rated definitely as a big airplane. Although the post-War decade had seen several abortive efforts to step out into hitherto unexplored territory, they had influenced the course of airplane design but very little. Germany's *Riesenflugzeug* development died under the strictures of the Treaty of Versailles, and our own Air Corps'

monstrosity, the Barling bomber, although flown successfully, soon proved to be a white elephant and was allowed to rot peacefully away behind the hangars at Dayton. Even into the early Thirties, any halfway determined expert with a handbook and a slide rule could prove beyond a doubt that there wasn't anything in the big-airplane theory — at least, after they became so big they weren't economical — "take the DO-X, for example."

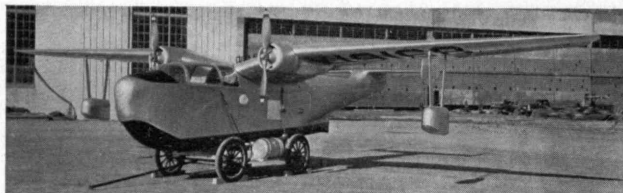
Fortunately, however, there were those who refused to take Dr. Dornier's solution as an example. Fortunately, there were those whose vision extended far beyond the apparent limitations of the times and who saw that one of the most important tasks for the immediate future was the linking together of the nations of the world by overocean aerial routes. Fortunately, too, in the past ten years the aerodynamicists, the metallurgists, the chemists, the radio technicians, and a host of others in the allied sciences have been hard at work



PING-PONG AND DECK QUILTS THREE MILES UP

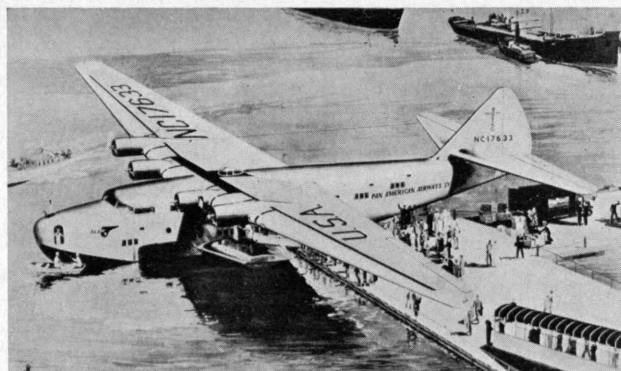
*Martin's concept of a transatlantic airliner of the near future. Note the spacious lounges, the cocktail bar, the sports deck aft*





Left. Martin checks a design by building a quarter-scale flying model. This model has a span of 43.5 feet, is powered with a 90-horsepower engine in the hull, carries two pilot observers

Below. The first of Boeing's 314's will be flying before many months. Six are under construction



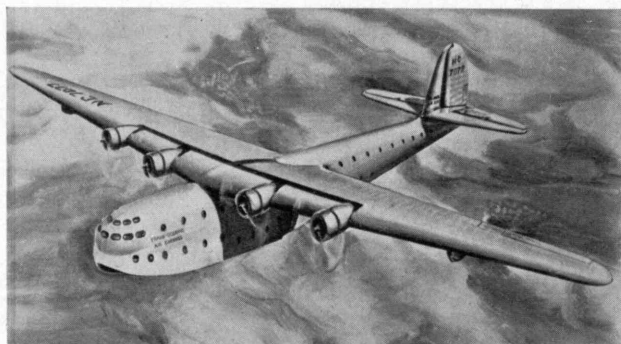
providing the necessary tools to turn that dream into reality. Today the lid seems to be off. Where a few years back we flew 20,000-pound boats and planned for 40,000-pound machines, today 40,000 to 60,000 pounders are flying our ocean schedules, with 70,000- to 80,000-pound equipment ready to be launched before summer. And, stimulated by government and private interest, design work is actively under way, in a half-dozen United States airplane factories, on flying boats with accommodations approaching those of a modern luxury liner, capable of taking the longest overocean route with a profitable pay load at 200 miles per hour, weighing anywhere from 100,000 to 250,000 pounds! Time now, of course, to go completely nautical and speak in terms of 50 to 125 tons.

Focal points for current discussion of big boats are the recently published report of the United States Maritime Commission (especially the section, "Aircraft and the Merchant Marine," prepared by Grover Loening) and Pan American Airways' more recently publicized request for bids on a group of ships far beyond anything that exists today. Required reading for anyone interested in going more deeply into the economics and the technique of long-range flying are the Loening report referred to above and J. C. Hunsaker's ('12) paper on overocean flying, read before Germany's Lilienthal *Gesellschaft* last October. Both Loening and Hunsaker take a broad view of the question of intercontinental transport, not overlooking the possibilities of lighter-than-air. A more biased point of view, but one nonetheless interesting to students of the subject, is contained in a report, entitled, "The Superiority of Flying Boats in Transocean Service," prepared by the Aeronautical Chamber of Commerce of America for presentation to the Maritime Commission.

Adequate analysis of the three reports would be beyond the limits of the present article. Worth while, however, to have a brief look at the specifications that Pan American has laid out for the airplane of the immediate future for its overocean routes and to examine, insofar as

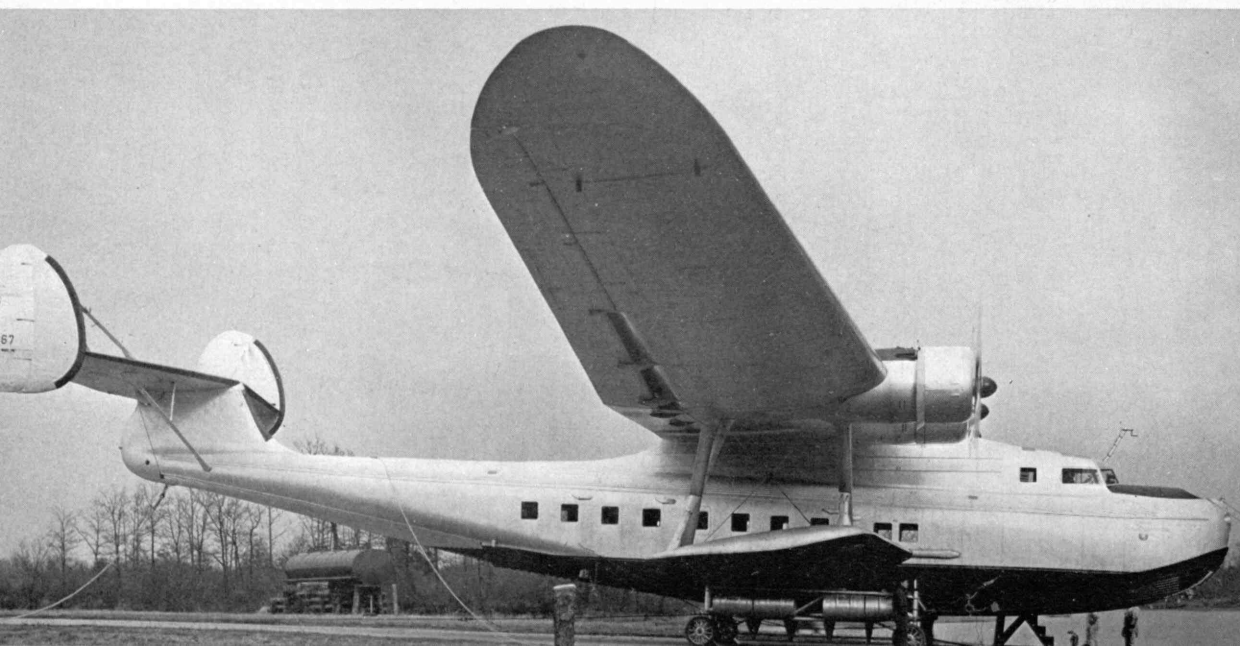
they are known, the plans of some of the American constructors who have been asked to bid, to try to foresee the type of equipment they will propose. It will be some months before even the preliminary tenders will be opened, but by backing up a bit over the ground already covered, it should be possible to take a running jump ahead that should land us reasonably close to the path of development that will probably be followed.

On December 9, Pan American tossed its new requirements into the laps of the designers in the form of a letter and a supplement over the signature of Colonel Lindbergh. In part, the latter stated that the contemplated aircraft "should have a pay-load capacity of 25,000 pounds, and in this condition be capable of flying 5,000 statute miles in still air . . . at cruising speeds of



Above. Consolidated's version of a transoceanic air express

Left. Martin's Ocean Transport, ready for shipment to Russia. It is the largest flying boat yet built in America

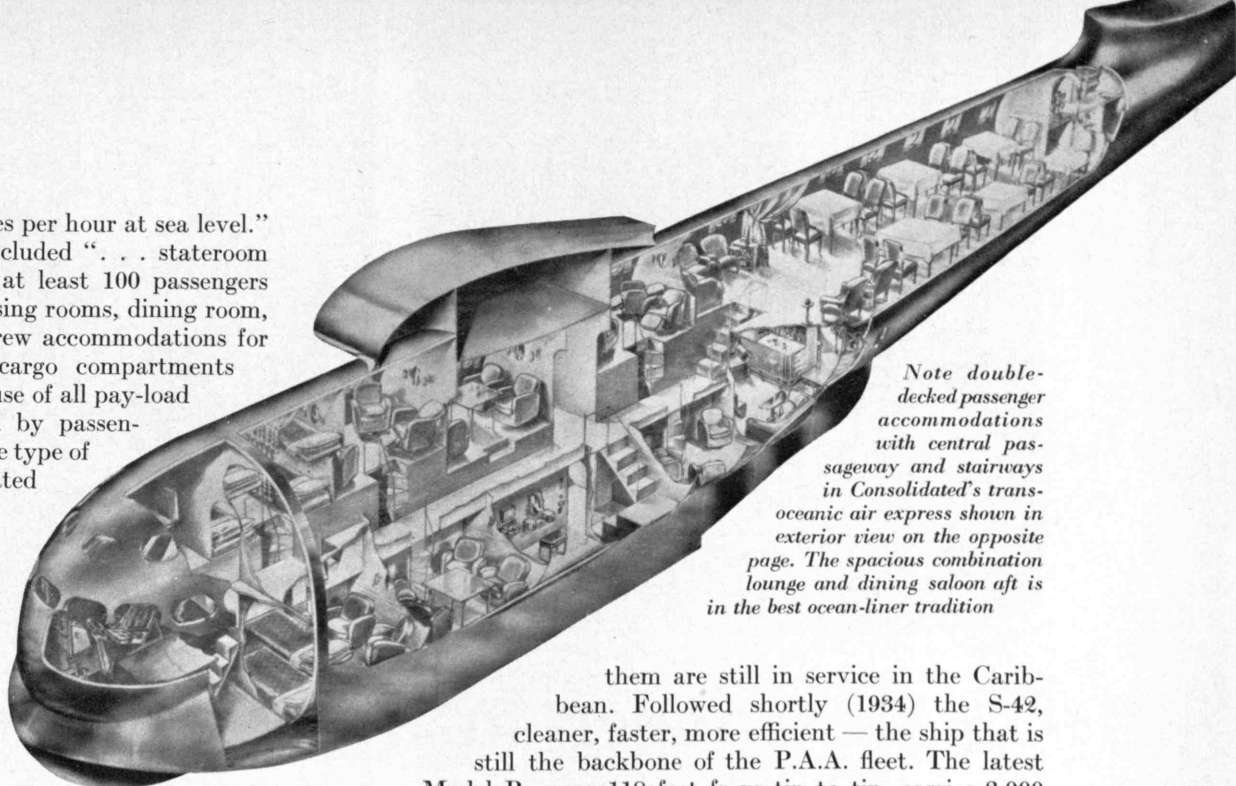


not less than 200 miles per hour at sea level." Further provisions included "... stateroom accommodations for at least 100 passengers with (adequate) dressing rooms, dining room, and a galley. . . . crew accommodations for a crew of 16 . . . cargo compartments . . . permitting full use of all pay-load capacity not utilized by passengers." Some clue to the type of operation contemplated lies in that part of the supplement which states that "special consideration will be given to designs which incorporate features permitting operation of the airplanes at 20,000 feet altitude or higher, with interior cabin pressures equivalent to 8,000 feet altitude."

What will come out of the pot when the preliminary bids are opened on March 15 is anybody's guess. Eight United States manufacturers (Martin, Consolidated, Sikorsky, Boeing, Douglas, Curtiss-Wright, North American, and Lockheed) were invited to submit proposals. It is a fair guess that at least five of them are now hard at work on the problem, all of them playing their cards close to the vest. Casting up the possibilities, Dan Sayre, '23, writing in *The Aviation News* (*Aviation*, January), says: "Just roughing things out on the backs of envelopes, most of our slide-rule friends come out with flying boats of gross weights of about 200,000 lbs. . . . Price guesses run from \$1,500,000, each, up to about \$3,000,000."

Since past performance usually points the way of future developments, the springboard method may well be employed at this point to gain some preliminary idea as to what these superliners of 1940 will look like. Most of the manufacturers involved have built big boats and have already completed studies for bigger ones, although nothing has so far been published on any projects of a size comparable to those now specified. The trends have been pretty well established, however, so that the process of extrapolation should not be too difficult for the reader. Consider, then, the past accomplishments of the five constructors who have carried, to a greater or lesser degree, the burden of development of big flying boats in America in the past five years — Sikorsky, Martin, Boeing, Consolidated, and Douglas.

Sikorsky may, perhaps, be rightly called the dean of the big commercial-boat builders. Although Pan American and its predecessor had been operating Consolidated's modified patrol boats (Commodores) for some time before the first Sikorsky S-40 went into service, the introduction of this machine in 1931 really inaugurated the Clipper Era. Clumsy and awkward-looking by modern standards, with its forest of struts and wires and suspended engine nacelles, it was definitely in the big-boat class. It carried 2,640 horsepower, had a wing span of 114 feet, and weighed 34,000 pounds, all up. Three of



*Note double-decked passenger accommodations with central passageway and stairways in Consolidated's trans-oceanic air express shown in exterior view on the opposite page. The spacious combination lounge and dining saloon aft is in the best ocean-liner tradition*

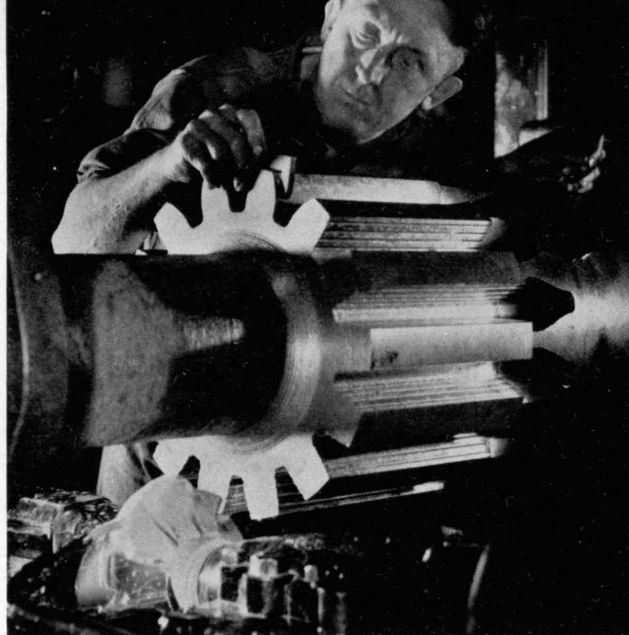
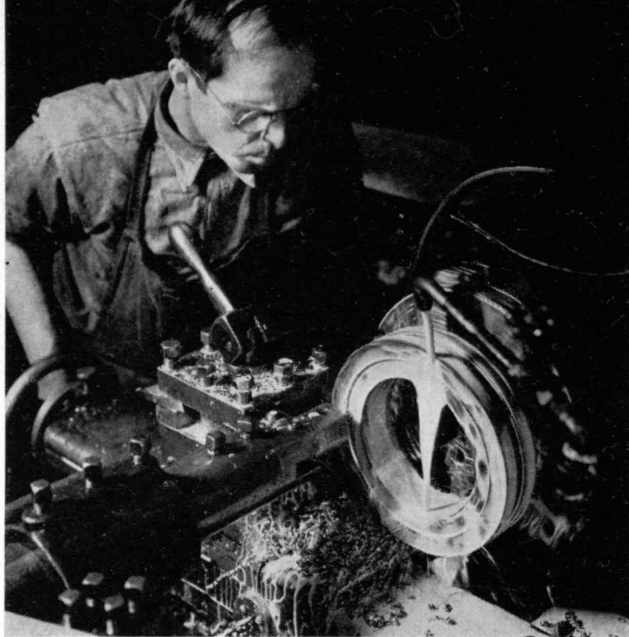
them are still in service in the Caribbean. Followed shortly (1934) the S-42, cleaner, faster, more efficient — the ship that is still the backbone of the P.A.A. fleet. The latest Model B spans 118 feet from tip to tip, carries 3,000 rated horsepower, and grosses 42,000 pounds.

But Sikorsky has always been a dreamer, and a dreamer with a high score of dreams turned to realities. So, when his talk turns to boats of 50 or 100 tons (as it often does of late), listen closely, for the guess is that his engineers are at work on projects of that order. An indication of the direction in which he is moving came in the appearance recently, off Bridgeport, of a so-called flying dreadnought for the United States Navy. Little is known of its characteristics, but it is very likely in the 60,000- to 70,000-pound range, up at least 10 tons from S-42. Next step will undoubtedly carry Sikorsky well above the 100,000-pound limit, probably closer to the hypothetical 200,000-pound figure assumed for the P.A.A. specifications. Through Mr. Sikorsky's courtesy we are permitted here a glimpse of the over-all appearance of the ship (see page 175).

When the possibilities of an air route over the Pacific were being studied, it became obvious that ships larger than the S-42's were needed to negotiate the 2,400-mile San Francisco-Honolulu route with any reasonable sort of pay load. When the specifications were written, Glenn L. Martin, veteran builder of naval aircraft, carried off an order for three boats of 51,000 pounds gross weight (span: 130 feet; 3,320 horsepower). These machines, the Martin 130's, went into service in the Pacific late in 1935 and, to date, have completed over a million and a quarter miles of flying between North America and Asia. This month Martin will deliver to the agents of the Soviet Government the largest flying boat yet to be built in America (opposite), his Model 156, which stems from the earlier 130's. The hull lines are similar but the wing span has been extended to 157 feet, the power stepped up to 4,000 horsepower, the gross weight boosted to 63,000 pounds. And on the boards is a further modification, a Model 157, with more power (4,800 horsepower total), capable of getting off the water weighing altogether some 70,000 pounds.

But Martin also has been dreaming and, at the same time, laying plans to transmute the Word into Flesh. In his experimental departments, plans and parts are taking shape, out of which will (Continued on page 194)





Young and Phelps

# The Engineer in Industrial Relations

## *The Labor Relations Bureau at M.I.T.*

BY KARL T. COMPTON AND W. RUPERT MACLAURIN

### I. WHY DOES THE ENGINEER HAVE AN INTEREST IN INDUSTRIAL RELATIONS?

*By President Karl T. Compton*

THE place of the engineer in industrial relations is an interesting subject. It is a particularly appropriate subject for discussion in *The Review* because a number of Review readers have approved and aided the establishment at the M.I.T. of an industrial relations bureau, the purposes of which are education, research, and dissemination of information on industrial relations with special reference to the situation in New England. My colleague, Professor MacLaurin, who is in immediate charge of this bureau, will describe in more detail its origin and objectives.

Why does the engineer have an interest in industrial relations? His interest is far more than that of the average citizen, for to a large extent he shares with the employer an interest and responsibility, in virtue of his special connection with industrial relations problems. Let me explain this special connection from three points of view.

In the first place, it is a fact of experience that men trained as engineers have much more than average likelihood of finding themselves ultimately in those high positions in industry which give them peculiar responsibilities for determining industrial relations policies. I might attempt to present logical reasons for this, but the facts seem to speak for themselves. In a fall address before the Boston Conference on Distribution, I discussed this subject, quoting statistics from a personnel survey of American industry by the director of the General Motors Institute of Technology, supplemented by pertinent census statistics. In that particular branch of business designated as industry, as distinguished from other branches of business like finance or distribution,

these studies indicated that a man trained in an engineering school is 12 times more likely to be found in the presidential position than if he had attended a nonengineering college; he is five times as likely to be treasurer; 30 times as likely to be in production; 174 times as likely to be in engineering; and 24 times as likely to be in sales. Grouping all offices together, an engineering-college graduate is 30 times as likely to find himself an officer in American industry as is a graduate of a non-engineering college. These facts, obtained from a survey of 50,000 officers in American industry, show that engineers have a relatively large share of responsibility in determining industrial relations policies. They indicate also that our engineering schools are not doing their full duty in training their students to grapple with important problems that will later confront them unless they include in their educational program some studies which will give a basis of sympathetic and constructive understanding of the problems of industrial relations. It is this fact that has impelled us at Technology to introduce some special studies and facilities in this field. Undertaken primarily for its educational value in the training of young men who will later become officers in American industry, a necessary by-product of this work, if wisely carried on, will be opportunity from time to time to serve those who are faced with practical problems in industrial relations along lines which Professor MacLaurin will suggest (see page 180).

A second reason for the engineer's special interest in industrial relations arises from his responsibility for the various developments which underlie the whole field of industry and its problems. His invention or perfection of new machines is responsible for technological unemployment. The same activities are responsible for the creation of new industries and new employment. His work has brought about the higher standard of living, in a material sense, which has been realized in every

group of our population, all the way from the physically or mentally unfit, who are cared for in our institutions, clear through to the group of productive workers, whether they be primarily laborers of brawn or brain. The engineer is principally responsible for increased productive power and the resulting higher profits which are shared alike by workmen in their wages, owners in their profits, and the public in reduced cost of goods.

I have nowhere seen a more effective brief summary of the favorable aspects of our technological age than has recently appeared in a bulletin on fundamental trends distributed by the First National Bank of Boston, in its initial chapter, entitled "The American System and the Abundant Life." On the other hand, we all admit the serious problems which have accompanied this technological progress. In the October issue of the *Tech Engineering News* was an interesting, brief article by John L. Lewis, in which he emphasized two features of technological progress which greatly concern the laboring man. Admitting that technological progress on the whole has created more employment than it has destroyed, he points out the very pertinent fact that this in itself does not solve the problem for the individual laborer who is thrown out of work by some technological change. He also points out the psychological effect of uncertainty and fear which is created by such instances and which spreads through the whole laboring group and leads them, through mass action, to seek a higher degree of security. Among several illustrations which he gives, I quote the following: "Witness, for instance, the recent introduction of automatic continuous rolling mills in certain steel plants. These mills employ practically no labor, and their emptiness of human beings is a constant reminder to the workers in other mills of what may happen to them."

When we realize the importance and complexity of these problems and the intimate way in which the engineer is associated with them, it is immediately evident that he not only has a legitimate interest in the solution but has a real responsibility for leading in the search for wise solutions.

The third reason for the engineer's interest in industrial relations is of a less direct and more philosophic nature, but fundamentally I believe it to be of even more importance than the two aspects of his responsibility to which I have already called attention. I refer to the present trend in political thought which is ably discussed by Walter Lippmann in his recent book, "An Inquiry into the Principles of the Good Society."<sup>1</sup> I cannot introduce this subject more effectively than by quoting from his chapter, entitled, "The Dominant Dogma of the Age": "Although the partisans who are now fighting for the mastery of the modern world wear shirts of different colors, their weapons are drawn from the same armory, their doctrines are variations of the same theme, and they go forth to battle singing the same tune with slightly different words. Their weapons are the coercive direction of the life and labor of mankind. Their doctrine is that disorder and misery can be overcome only by more and more compulsory organization. Their promise is that through the power of the state men can be made happy.

<sup>1</sup> Little, Brown and Company, Boston, 1937.

"Throughout the world, in the name of progress, men who call themselves communists, socialists, fascists, nationalists, progressives, and even liberals, are unanimous in holding that government with its instruments of coercion must, by commanding the people how they shall live, direct the course of civilization and fix the shape of things to come. . . .

"So universal is the dominion of this dogma over the minds of contemporary men that no one is taken seriously as a statesman or a theorist who does not come forward with proposals to magnify the power of public officials and to extend and multiply their intervention in human affairs."

Continuing in his next chapter, entitled, "The Gods of the Machine," he goes on to say: "The current return to the authoritarian principle in politics finds its principal sanction in the belief that the new machine technology requires the control of an omnipotent state. There are many versions of this basic idea. By some it is said that only the strong arm of government can protect men against the brutal oppression of their machines; by others that only the power of government can realize the beneficent promise of the machines. But all agree that in the recent progress of technology there is some kind of deep necessity which compels mankind to magnify the sovereignty of officials and to intensify their intervention in affairs. The modern state holds its sovereign power by grace of the gods of the machine."

These tendencies, so aptly phrased by Mr. Lippmann, are the most powerful and may be the most dangerous movements in the world today, whether they be considered from the international viewpoint or on the basis of the internal economy of our own nation and the political life of its citizens. Note that the movement toward greater control by the state, permeating not only corporate industry but also the freedom and initiative of individual citizens, is a reversal of those recent centuries of progress which has culminated in democratic government and whose basic objective and greatest triumph has been the increasing protection of the individual against regimentation and coercion by the government. There is grave danger that the great triumph in setting up a government "of the people, by the people, and for the people" is being replaced by a government "of the people, by the government, and for the government." In proportion as this comes to pass, we will have lost the emphasis on individual liberty and initiative and rights of minorities, which all agree have provided the environment responsible for the remarkable progress in material welfare, education, and satisfaction in living which has marked the last two centuries of Occidental civilization.

The engineers have a peculiar interest in this situation because it has been the protection of individual initiative and freedom of thought which has enabled them to make their recent contributions to human welfare. The authoritarian state is not a modern invention. As Walter Lippmann points out, it was practiced by the Pharaohs, by the Byzantine emperors, by Louis XIV, by the Hapsburgs, and by the Romanovs. Regulation of industry by the state was never more minute than in the stagnant days preceding what we call the Renaissance and the Industrial Revolution. Both the state



and the great guilds, which were the predecessors of the modern labor unions, established in great detail regulations which had the effect of, and were probably designed for, maintaining the *status quo*. In the textile industry, for example, in the 17th and early 18th Centuries, there were rigid regulations regarding the width of reeds and number of threads in which fabric could be woven in every textile center of Europe. When, in 1718, it was discovered that a certain town in France had been overlooked in this regimentation, an edict was published, stating that "His Majesty is informed that no regulation specifies from how many threads those cloths are to be composed, a matter which must be attended to without fail."

It is obvious that no technological progress and therefore no contribution by engineers to further improvement in our standard of living can be possible in such a situation, and engineers therefore view with great alarm the tendency of the past few years to revert to regimentations and regulations sponsored by government, and by agreements within industries and between industry and labor, which tend to crystallize the *status quo* and stifle further progress.

It is our hope that a clear understanding of these dangers and an intelligent, coöperative effort, sponsored jointly by the most enlightened conditions in industry, in labor, and in the engineering profession, can find the necessary solutions to problems of industrial relations without going to those extremes which will stifle further progress of civilization for the sake of finding an easy and arbitrary solution for some of our existing difficulties. This is a basic reason for the interest of engineers, generally, in the subject of industrial relations and of the M.I.T., particularly, in its present effort to sponsor an industrial relations bureau. We realize the importance of the problems; we are anxious to do what we can to aid in their solution both now and in the future; and we are extremely anxious that the solutions adopted shall not undo what the engineers have done in the past and can do in the future for the advancement of human welfare.

For these reasons we were greatly interested when the suggestion first came to us that we should establish in New England a labor relations bureau somewhat along the lines of those recently established in several other educational centers in this country and Canada. Before following this suggestion, I made some investigation of the success of these earlier bureaus and of the reputation in which they were held by industrial and labor groups in whose judgment I had confidence. Being reassured by this investigation, we have proceeded to lay plans for an Industrial Relations Section in our Department of Economics and Social Science and to seek the necessary financial support for conducting this Section during a trial period of five years. I am happy to announce at this time that the coöperation and the contributions toward this project from over 50 of the leading industrial organizations of the country have assured us of the necessary support to carry through this effort. This bureau is in the immediate charge of Professor W. Rupert Maclaurin, who has had some actual industrial experience, who has received his advanced training at the Harvard Business School, and who, among his other achievements, has made an exhaustive study of the

economic rehabilitation and the industrial relations movements in recent years in Australia, a country which has already passed through many phases of our present American industrial situation. I have asked Professor Maclaurin to join me in my discussion of this subject, and he describes below something of the background and plans of our Industrial Relations Section.

## II. WHAT THE INDUSTRIAL RELATIONS SECTION AT M.I.T. HOPES TO DO

*By Professor W. Rupert Maclaurin*

THE development of specialized departments for the study of industrial relations in universities dates back some 15 years and owes its inspiration to C. J. Hicks, who was at that time in charge of industrial relations for the Standard Oil Company of New Jersey. Because of his intimate knowledge of industrial relations, not only in the Standard Oil of New Jersey but also in many of the other leading companies of the United States, Mr. Hicks was invited from time to time by Harvard, Yale, Princeton, and other universities to address their classes in labor. In visiting these colleges, he was impressed by the fact that for one reason or another these courses took little or no account of the actual practice being followed by some of the leading companies in the United States in their relations with their employees. The difficulty, as he saw the problem, lay principally in the fact that the professors in charge were not given the time or the money to permit them to keep in close contact with current developments in the field of industrial relations. In discussing this question with E. W. Kemmerer, the head of the economics department at Princeton, Mr. Hicks suggested that it should be possible to build up an industrial relations library of current as well as historical material similar to the library that Princeton already had in corporation finance. As it had proved possible at Princeton to teach corporation finance from a practical standpoint on the basis of material collected and available to professors and students in a specialized library in corporation finance, Mr. Hicks believed that it should be possible to handle the course on labor in the same fashion.

As a result of this suggestion, it was decided to establish a new section of the department of economics, which would specialize in the field of industrial relations, keep in close personal contact with actual developments in the field, and write reports of current interest and significance to businessmen, government officials, and labor organizations. John D. Rockefeller, Jr., agreed to finance the program for an initial five-year period, and at the end of that time, the section having proved its value, Mr. Rockefeller endowed it. This was in 1925. Since then the Princeton industrial relations section has become very well established. During the last three years, the section has received nearly 700 specific requests for information and material. While about one half of these requests have been taken care of by sending mimeographed or printed memorandums previously prepared, the remainder have required additional research to prepare answers. (Continued on page 196)

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# THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

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## *Alumni Day 1938*

PLANS for Alumni Day, to be held this year on Monday, June 6, have progressed to the point where it is possible for us to give you a preview. This is the last year in which the Institute will hold classes in the Rogers Building. Recognition of the significance of moving the School of Architecture to Cambridge and of our final departure from Rogers will supply the keynote for the day.

In accordance with this theme, registration, which has always taken place in Cambridge, will occur in the main lobby of the Rogers Building, on Boylston Street, Boston, between nine and ten o'clock in the morning. At ten, there will be a symposium along the lines which have been followed in the past, but it will be of more general interest, perhaps, than any of those which have preceded it, as it will be illustrated and will deal with the impact of modern science and engineering on modern arts. The symposium will end about noon, and will be followed by some very brief exercises of farewell to Rogers.

At this point, activities will be transferred to Cambridge. The always popular alfresco lunch will be served in one of the courts, as it has been in the past. In the afternoon, activities already scheduled include a dedication of the new Architecture Building, a very complete exhibition and demonstration of the impact of science and engineering on the arts, and the Senior Class Day exercises. The latter have become increasingly interesting and entertaining with each passing year, and, with the help of the 50- and 25-year Classes of this spring, it is hoped they will be even better this time. Outstanding Alumni and seniors will be on the program.

Finally, at the annual Alumni Dinner, to be held again in the Statler Hotel, Boston, Marshall B. Dalton, '15, President of the Alumni Association, will speak briefly; President Compton will give his annual report on the state of the Institute; awards will be made to the chairmen of winning regions in the Alumni Fund Campaign; and the program will be closed by an entertainer of international reputation, probably the most famous man in this field who has ever appeared before a Technology gathering. Members of each Class will, of course, be seated together as in the past, and five-year reunion Classes will, as in the past, be given preferred seating in the dining room. All in all it will be a novel evening, with gaiety in the ascendancy.

Last year's Alumni Day broke records for attendance and made it abundantly clear that the annual reunion plan has the hearty support of Alumni. John E. Burchard, '23, chairman of Alumni Day, 1938, and his associates on the committee, with the plans they have formulated and the growing interest in Alumni Day, may confidently expect a new high in enthusiasm and numbers next June.

## *Corporation*

WILLIS R. WHITNEY, '90, Vice-President of the General Electric Company, and Francis J. Chesterman, '05, Vice-President of the Bell Telephone Company of Pennsylvania, were elected life members of the M.I.T. Corporation at its meeting on January 5. J. Willard Hayden, long associated with Hayden, Stone and Company, of which his brother, the late Charles Hayden, '90, was founder, was elected a special member of the Corporation, succeeding Halfdan Lee, whose term had expired.

Until his election as vice-president of the General Electric Company, Dr. Whitney was director of its research laboratory, of which he was the founder. Following his graduation from the Institute, he served for many years on the Faculty, and he was a term member of the Corporation from 1917 to 1922, and from 1923 to 1928. Mr. Chesterman, a native of Taunton, Mass., began his engineering career on the staff of the American Telephone and Telegraph Company in Boston, later joining the New York Telephone Company. From 1920 to 1926 he was chief engineer of the Bell Telephone Company of Pennsylvania and associated companies. He served as a term member of the Corporation for five years, beginning in 1931. Mr. Hayden, in addition to his long association with the firm of Hayden, Stone and Company, is a director of the Eastern Steamship Company and Eastern Massachusetts Street Railway Company.

President Compton reported to the Corporation the accomplishment of some of the objectives which were approved at its meeting in October, 1936. These include provision for additional dormitory space through the purchase of Riverbank Court Hotel, the awarding of a contract for a wind tunnel of new design and great flexibility as a memorial to the Wright brothers, and progress in the development of funds for the construction of a propeller testing tank and a naval towing tank for the Department of Naval Architecture and Marine Engineering.

Dean Bush, '16, announced that construction of the new building on Massachusetts Avenue to house the School of Architecture and to provide additional facilities for engineering departments is proceeding on schedule and is expected to be ready for occupancy next fall.

## *Bermuda High*

METEOROLOGISTS have suspected for some time that weather conditions on the American Continent are influenced by a high-pressure area which lies over the Atlantic Ocean off Bermuda, but until recently they had no means of accurately charting this body of upper air to test the theory. Development of automatic radiometeorographs which record barometric pressure,



humidity, and temperature has made such a study possible. Delbar P. Keily, '34, of the Institute's meteorological staff, and Douglas S. MacKiernan, Jr., '36, have recently completed the first cross-section study of the Bermuda High, as this area is familiarly known to meteorologists.

The study was made during a voyage of the Bull Line steamship, *Emilia*, from San Juan, Puerto Rico, to New York. For five days and four sleepless nights, Keily and MacKiernan sent sounding balloons bearing radiometeorographs into the Bermuda High. Twenty-five readings were taken at intervals of four to five hours, and each time a balloon was released the obliging captain of the *Emilia* ordered the ship's course changed to bring the wind abeam so that the balloons might float away without becoming tangled in the rigging. These upper-air soundings varied from three to nine miles in altitude, and as soon as a balloon began its ascension Keily and MacKiernan devoted themselves to the task of recording the data broadcast from the radiometeorograph as it passed through the various strata of the high-pressure area. Thus for fifteen hundred miles the Institute's research team probed the high-pressure area, bringing back data from which it is hoped to learn much of great value in weather forecasting.

Meteorologists are interested in the Bermuda High (which is responsible to a large degree for the salubrious climate of Great Britain's well-advertised island mecca for tourists) because of its seasonal habits. In winter the area of the Bermuda High recedes, its center moving far out over the bleak Atlantic, but with the coming of spring it moves nearer the American Continent, spreading out toward the Gulf of Mexico. These changes in area are attended by variations in meteorological conditions, a fact which leads meteorologists to suspect that this high-pressure area influences the weather in the Eastern United States. There is evidence, for example, that the disastrous floods east of the Mississippi River two years ago were due largely to the effects of the Bermuda High.

Preliminary studies have led meteorologists to believe that an accurate chart of the area will reveal certain seasonal and monthly trends which may be accurately predicted and used to forecast weather conditions over a longer period than is now possible. The importance of successive chartings of the Bermuda High, as explained by Carl-Gustav A. Rossby, Professor of Meteorology, lies in the belief that movement of air in the upper atmosphere is closely linked with mean monthly rainfall. The first chart of the Bermuda High is part of a long-range research project of the Institute and the United States Department of Agriculture on the circulation of large atmospheric areas. Through further studies it is hoped to gain knowledge of the structure of the high-pressure area from a three-dimensional point of view.

### *Graduates in City Planning Find Positions*

THE success with which recent graduates of the Institute's City Planning Course have been placed in responsible positions in their chosen profession is indicated by a survey recently made of the Classes of 1935, 1936, and 1937. Of all students completing their scholastic work for the graduate or undergraduate degree, 75

per cent were found to be engaged in some professional capacity in the field of city and regional planning. The majority of these were employed by local or state planning boards, the remainder being in the offices of private consultants or engaged in teaching. Graduates of the Course are also on the staffs of the Institute, Columbia University, Western Reserve University, and University College of the South West in Exeter, England.

Of the four appointments recently made by the New York State Division of Planning, after a civil service examination, three went to graduates of Technology's City Planning Course during the past two years. The examination, held in a number of cities throughout the country, was taken by 62 candidates for the position of state planning research assistant, seven Institute graduates being among the 21 who passed.

### *Student Aid*

SCHOLARSHIPS and loans for 1937-1938 will exceed the totals for the previous year by about an eighth, the total so far authorized being \$312,119. The division this year between the two forms of aid now stands at \$201,392 and \$110,727, respectively.

Sixteen fellowship awards (including two postdoctorates) carry stipends of \$16,300, and 271 graduate scholarship grants amount to \$89,292. The 504 undergraduate scholarship holders will receive \$95,800, of which \$43,200 goes to 215 freshmen.

The Technology Loan Fund Board has acted favorably upon 286 applications, of which 46 were those of graduate students and 240 from undergraduates, the borrowings authorized being \$18,833 and \$91,894, respectively. Inasmuch as the current loans total slightly under those for 1936-1937, it is apparent that the increase of an eighth in the total student aid this year is entirely due to increased scholarship grants.

As of January 8 (including loans actually made toward first-term tuition), 1,729 men borrowed \$1,094,422.90 from the Loan Fund since its establishment in 1930. Repayments of \$348,108 on principal account had been received, which sum equaled 83 per cent of the notes which were due for repayment under the fund's liberal provisions, by which a man is expected to repay at the rate of \$50 every six months following graduation. Many obligations are being discharged in advance of maturity dates on the notes, \$15,741 of such advance payments having been received during the current fiscal year which began July 1. Also, up to January 8, 411 of the 1,729 borrowers had repaid their entire loans.

Inasmuch as all obligations so far due for repayment are from men whose Classes have been out of the Institute six years or less, the collection ratio of 83 per cent is particularly encouraging to the Loan Fund Board. Interest is being paid regularly on three-quarters of the unpaid notes, which are considered as extended obligations. It is, therefore, anticipated that ultimately the collection ratio will be at least 95 per cent of the loans made. Up to January 1, interest received (at the rate of two per cent) totaled \$70,332.79, which exceeded the total of all unpaid matured obligations and was over four times the total of unpaid matured obligations upon which extensions had not been granted.

## Lalor Fellowship

AS a memorial to the late Arthur A. Noyes, '86, founder of the Research Laboratory of Physical Chemistry at the Institute, one of the Lalor Foundation's five fellowship awards for research in chemistry and related sciences has been specifically assigned to the Institute. The first recipient of this fellowship, Dr. Leland J. Haworth, is engaged in research on the electrical properties of substances at very low temperatures. One of the first problems which he is undertaking is the fixing of the temperature scale below four degrees through the use of a magnetic thermometer, which makes possible the interpretation of the relation between magnetic susceptibility of certain preferred substances and the absolute or thermodynamic scale of temperature. An accurate knowledge of the temperature scale is a fundamental requirement in interpreting experimental results obtained in cryogenic research. Dr. Haworth will also study the supraconductivity and heat conductivity of single crystals. Coming to the Institute from the University of Wisconsin, Dr. Haworth has carried on previous research in energy distribution, phosphorescence, and nuclear physics.

## Mathematics at Technology

IN our series of Visiting Committee Reports we present this month a condensation of the statement made to the Institute's Corporation by the Committee appointed to visit the Department of Mathematics during 1936-1937.

## DEPARTMENT OF MATHEMATICS \*

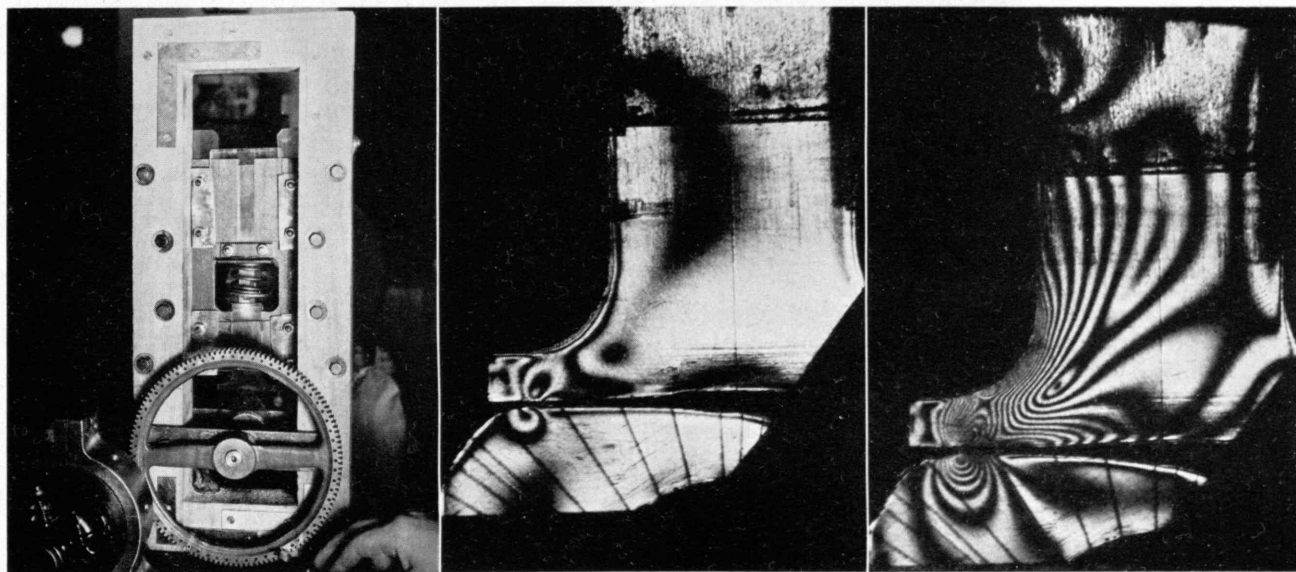
AT its meeting, the Committee discussed the following topics:

*Admissions.* The general trend of requirements in mathematics for entrance into the Institute meets with the approval of this Committee. The members of the Department feel that the mathematical training of the average student verifies the correctness of the entrance requirements and that in this Department the increasing number of students admitted to the Institute without entrance examination is working satisfactorily.

Mathematics can, in many ways, be considered the fundamental cornerstone for all engineering courses. Time, of course, must of necessity limit the extent of the teaching even in this essential Department, and yet, because of the basic nature of mathematics, we feel it necessary that all work in the Department be thoroughly and satisfactorily done.

*The General Undergraduate Program.* Much time was spent in the detailed discussion of the general mathematical courses given to the undergraduates. There seems to be a feeling that there could advisedly be a closer relationship between the teaching of descriptive geometry, now given in the School of Architecture, and the courses given by the Department of Mathematics. The course in descriptive geometry could be used to

\* Members of this Committee for 1936-1937 were: Martin H. Eisenhart, '07, Chairman, George A. Campbell, '91, R. E. Bakenhus, '96, William S. Newell, '99, Willis F. Harrington, '05, Joseph W. Powell, Oswald Veblen, and Harald M. Westergaard.



Photographs by William Tucker

## WHAT DYNAMIC STRAINS LOOK LIKE

The study of strains in objects in a dynamic condition — as in this model of a cam and tappet — is made possible by a new application of the Edgerton ('27) stroboscopic technique developed lately in the Institute's laboratories. Of these photographs, the first shows apparatus by means of which the celluloid model of a tappet is displaced by a celluloid model cam, turning at the rate of 1,500 revolutions per minute, driven by the large gear wheel at the base of the assembly. Spokes have been removed from the wheel to permit easier visibility. Closing the key which appears in the lower right corner permits the movable pin on the wheel rim to trip off a single intense flash of light lasting less than five-millionths of a second, thus photographing the model at any desired point in a revolution.

The light from the modified stroboscope, a small capillary mercury tube heated to 200 or 300 degrees C., is filtered so that only the green is used, and is passed through polarizing screens. When the model is under no strain, a white photograph results. Slight strain, as in the second photograph, which shows the apparatus at rest, shifts the polarity of the light, giving black lines. Greater strains produce a greater number of lines, as in the third photograph, taken with the apparatus in operation. Filtering of the light is done to produce sharper lines; it is necessary to work with light of one color, since the angle of polarization is a function of wavelength. Since in this technique the light must pass through a filter, the celluloid model, and two polarizing screens, a very intense flash must be used





#### IN THE NEW LABORATORY OF STRUCTURAL ANALYSIS

*Model structures are becoming more and more important in engineering research, not only as a means of checking theories but as stimulating visual aids to teaching. This truss bridge model in the new laboratory of structural analysis in the Department of Civil and Sanitary Engineering is used to study the structural action of bridges of this type. The importance of advanced studies in this field is indicated by the fact that recent experiments on truss bridges suggest they do not behave in strict accordance with design theory. In the model shown, the loads are applied by means of a hand wheel beneath the truss, the reactions are measured on a platform scale, and the resulting distortions of the structure are determined by dial gauges. The analytical and experimental data are then compared*

develop the power of expressing mathematical ideas in visual form. Professor Veblen [of Princeton] referred to his own experience in using a course in projective geometry for this purpose. He also referred to the appreciation which he had found among undergraduates for courses which present up-to-date mathematical ideas not ordinarily included in routine courses. It was pointed out that various members of the Department are introducing such ideas whenever possible in the existing courses. Attention to these aspects of mathematical instruction will tend to improve the engineering ability of the Institute graduate. The fact that about three-quarters of the students are now taking courses in differential equations, including a wide range of applications, was commented upon favorably.

**Mathematical Laboratory.** The facilities of special equipment for mathematical calculations seem to be very comprehensive, and in the report of this Committee, submitted three years ago, the recommendations made for more satisfactory housing of these instruments have been satisfactorily taken care of. There are, however, a few pieces of equipment which this Committee believes should still be added to the laboratory. These would be a Coradi mechanical integrator, an ellipsograph, and a pantograph, involving a cost of approximately \$1,300.

**Course XVIII.** Members of the Committee were impressed with the comprehensive coverage offered in the curriculum of this Course. An elective course in mathematical statistics has been added since the last report of this Committee, meeting an additional need.

**Statistics of Teaching.** Herein, the Committee believes, lies the most serious problem of the Department. There is unquestionably a lack of personnel to carry on, fully and effectively, the burden of teaching and at the same time do satisfactory work in research. In the larger undergraduate courses there is an average of 26 students

per section, with a maximum of 38, and this Committee feels that steps should be taken at the earliest possible opportunity to reduce these sections to somewhere in the neighborhood of 20 men. A good deal of time was spent in the discussion of assistants. The conclusions were reached that the older and more experienced men on the staff should be relieved to a greater extent in their teaching load and that they might be given much required help by the addition of a group of graduate student assistants.

**Journal and Library.** The Committee agrees with the policy and procedure now being followed in the handling of the *Journal of Mathematics and Physics*. With regard to the Library, the Committee feels that although there have been additions made from year to year, yet if ways and means could be found to complete the back numbers of the mathematical periodicals, it would probably increase the effectiveness of the Department's work.

In general it might be said that this Committee confirms the judgment arrived at by the previous Committee which spent considerable time in an investigation of the Department three years ago, namely, that the teaching and program in general offered at the Institute by the Department of Mathematics is very effectively and satisfactorily carried out. The few recommendations offered by this Committee will undoubtedly further improve the operations of the Department.

#### *Darragh de Lancey, 1870-1937*

**D**ARRAGH DE LANCEY, whose death occurred at his home in Waterbury, Conn., on November 15, after a severe illness of more than two years, exemplified to a very high degree the qualities of the able engineer and the attributes of a true gentleman of culture and broad interests. In these respects he might be chosen as



FRANCIS R. HART, '89 (1868-1938)

*The death of Mr. Hart, President of the United Fruit Company and long a member of the Executive Committee of the Corporation, on January 18, two days after his 70th birthday, removed an Alumnus long influential in Institute affairs and a man distinguished in business and in the gracious art of living.*

*He was elected a member of the Institute's Corporation in 1907, when he was made treasurer, and he became a life member of the Corporation in 1909. Mr. Hart's first term as treasurer continued until that year, and, in 1913, he was again elected treasurer, serving until 1921. He was a member of the Finance Committee from 1910 until 1936.*

*Aside from his numerous business interests, Mr. Hart was well known as an authority on the cultural and economic history of the Central American countries and the Caribbean Sea, and was the author of three well-known books which grew out of his research in the history of the Caribbean. They are "Admirals of the Caribbean," "The Disaster of Darien," and "The Siege of Havana." He was also the author of many monographs and historical articles*

one of the type of Technology-trained men which it is the aim of the Institute to produce, for he not only visualized his duties as alumnus, engineer, and citizen in an intelligent, loyal, and comprehensive manner but gave himself unsparingly to those national and local services for human welfare for which his special personal qualifications and training so admirably fitted him.

Mr. De Lancey was born in East Orange, N. J., July 31, 1870. He was graduated from Phillips Andover Academy in 1886, and from the M.I.T. in 1890. On July 1 of that year, a month before he had attained his 20th birthday, he entered the employ of the Eastman Kodak Company at Rochester, N. Y., then in its in-

fancy, and supervised the building of the original plant at Kodak Park. On January 1, 1892, he became works manager in charge of all the rapidly growing operations at Kodak Park. It was in these years and the succeeding six years that he was in very close contact with George Eastman. Undoubtedly, Mr. Eastman watched with great interest and appreciation the brilliant work of his young executive and began to recognize the substantial quality of Technology training, to gain knowledge of the institution itself, and to obtain an interest therein. With the rapidly developing and oftentimes extremely delicate experimental work in chemistry and engineering, De Lancey found it necessary to secure competent assistance and naturally turned to his Alma Mater. One of the chemists engaged for this work was Harriet T. Gallup, '94, who entered the employ of the Kodak Company after a year spent in teaching — followed by some special work at the Institute — and to whom he was married in 1897. At about the same time, Mr. De Lancey secured also, as an assistant, F. W. Lovejoy, '94, now President of the company.

So strenuous was the work of De Lancey during these early years of the development of the snapshot camera that in 1898 he had a nervous breakdown, followed by a recurrence the following year, when his physicians insisted on his retirement from this exacting work. But he had foundations splendidly established, and had also created that close relationship between the Eastman Kodak Company and the Institute that led to many later appointments and eventually the memorable generosity of Mr. Eastman.

After a year of rest and recuperation, De Lancey took charge of the manufacturing work of the Library Bureau in Boston, and in 1902 became an executive with the Stanley Instrument Company in Great Barrington, Mass. In 1905 he removed to Waterbury as an executive of the Waterbury Buckle Company and remained with that firm until 1914. The ability and splendid public spirit of De Lancey was recognized by Waterbury businessmen, and he was elected president of the Waterbury Chamber of Commerce in 1915, but declined to accept the post.

With the advent of the War he became secretary of the Second District Draft Board and, later, chairman. During this service it was observed that many men needed as executives and skilled workmen in industry were enlisting. Mr. De Lancey took the matter up personally with the War Department, and from this conference came the plan for the industrial furlough section of the Adjutant General's Office, of which De Lancey was made chief. How notable his service was in this work is indicated by the fact that 25,000 men were promptly returned from training camps to essential industries, and ten times that number would have been so transferred had the War continued. While in this work he wrote the "Manual of Selective Service and Industrial Furlough," published by the government in 1918. After the Armistice, De Lancey served in the Central Bureau of Planning and Statistics which was set up to keep President Wilson informed as to developments in this country while he was at the Peace Conference. For two years De Lancey served on the United States Shipping Board, for a part of the time as director of the divi-



sion of industrial relations, a position from which he resigned in 1921. During this whole period he was also a director of two banks in Waterbury and interested in civic affairs, as he had been in earlier years.

In 1922, De Lancey did a most unusual thing. His War work was over, and he was free to follow a hobby long cherished. He entered the Yale School of Fine Arts, specializing in sculpture, and received his bachelor's degree in 1925. From that time until illness prevented, he devoted most of his time to sculpture and to travel. Among his important works are a memorial monument to his daughter, which stands in Great Barrington, and the Newtown, Conn., War Memorial. His work was awarded second mention in the Beaux Arts Institute of Design, New York City, in 1923, and first mention in 1924.

One other aspect of this many-sided man must not be overlooked. His personality, his capacity for friendship, and his ability to adjust himself harmoniously with his environment, whether in the office, the workshop, or the homes of rich or poor, made him a notable figure. This could be possible only with a person of broad sympathies and real democracy. There was nothing false or condescending in his attitude toward those less fortunate and less cultured than himself. The laborer in the street was his fellow citizen in fact and not merely in name; the friend he met in the club received no more sympathetic or courteous treatment. He appreciated life and its problems, and discussed them with sanity, breadth, and insight that may have been the result of his rare combination of scientific and artistic qualifications. Thus his keen perceptions, his innate kindliness of spirit, and his deep loyalty to ideals made him a trusted and cherished friend. Fortunate were those of his Class or those of other Classes of Institute men who have felt the power of his positive manliness, as well as his serene, generous, and straightforward personality. The Institute can ill afford to lose Alumni of his type and grieves in the passing of this notable son.

### *Ross F. Tucker, 1868-1937*

WHEN Professor Ross F. Tucker, '92, was chosen, in 1926, to take charge of the newly established Course in Building Engineering and Construction, there came to the Institute not only an able engineer of long experience but a teacher endowed with those intangible qualities of character and personality which stimulate the imagination of students and subtly enrich the flavor of knowledge. Professor Tucker's death, on December 26, was, therefore, a loss of more than ordinary significance to his colleagues on the Faculty and to every student who had the good fortune to come under his influence.

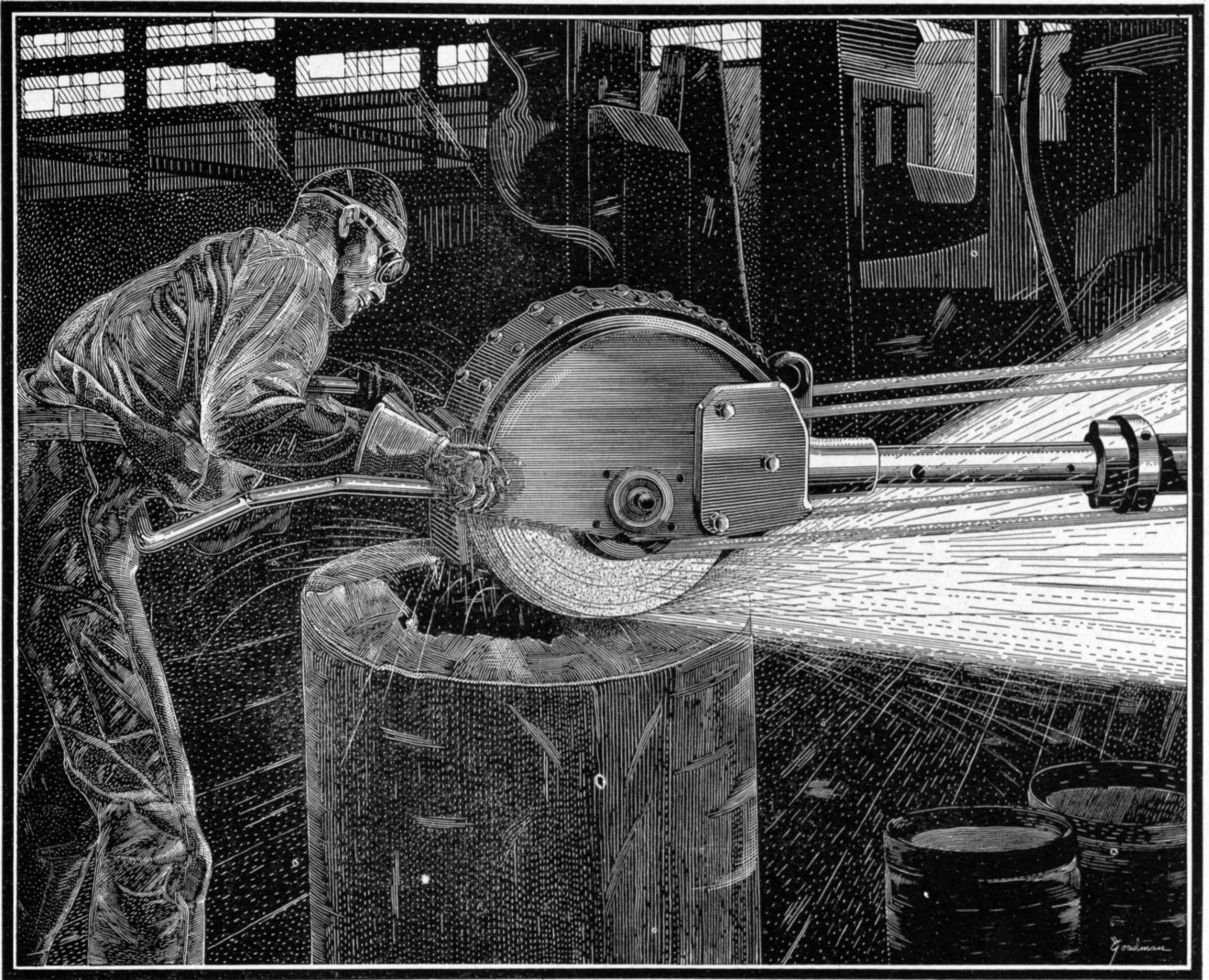
A pioneer who, during his long career, made many notable contributions to engineering advancement, Professor Tucker encouraged independence of thought. He discouraged the unquestioning acceptance of knowledge as perfect or complete, and by his teaching aroused intellectual curiosity and stimulated scientific investigation. His unfailing consideration for the opinions of students and the atmosphere of professional equality in his classes promoted mature thinking and engendered

the affection and loyalty of understanding friendship. The students in Building Construction of the Class of 1929, the first to be graduated from the Course, gave a dinner for Professor Tucker shortly before their commencement and presented him with a gift as a token of their admiration. Later Classes followed this custom, and the students of this year's Class had already raised a fund for such a purpose. This fund will now be devoted to the purchase of books for a Ross F. Tucker Memorial Shelf in the new branch library now nearing completion.

Born in Sacramento, Calif., 69 years ago, of New England ancestry, Professor Tucker's interest in engineering probably was aroused by the achievements of his father, Captain Samuel F. Tucker, one of Sheridan's officers in the Civil War, and who afterwards was engaged in building the fortifications and harbor works of San Francisco. Later Ross Tucker was with his father when he directed construction of the long tunnel of the Central Pacific Railroad through the Sierra Nevada Mountains, a feat achieved by the use of hand drills and pure nitroglycerin. His mother, Emma Rebecca Tucker, was for 30 years principal of one of the larger schools in Oakland, and was an ardent suffragette. Thus from his father he inherited the pioneering spirit of an engineer, and from his mother the courageous independence of thought and action that was characteristic of him.

Following his graduation from the Institute, Professor Tucker joined Ernest L. Ransome, the Englishman who had come to the United States with the then new technique of reinforced concrete construction. Convinced of the possibilities of the method, Professor Tucker founded the Aberthaw Company in Boston, the first concern of its kind in the country. Two years later, seeking broader fields, he went to New York and was successful in introducing concrete construction in the building industry there. One of his most notable advances was the mesh system of floor construction of cinder concrete, which is in wide use in fireproof steel structures today. Another of his important achievements was the development and installation of the vault lighting system in the New York subway and the Pennsylvania terminal. In this he perfected Ransome's idea of glass set in concrete slabs, to permit daylight to penetrate into the subway stations. As a member of the Building Trades Employers Association and later as chairman of its board of governors, Professor Tucker was influential in arbitration in this industry. For several years he was chairman of the executive committee of the General Arbitration Board.

During the World War Professor Tucker joined the Thompson Starrett Company and was in charge of several important building projects for the government. One of these was the installation of the water supply system for Camp Upton on Long Island. That project completed, he was called upon to carry out a similar task for the ordnance department at the United States explosives plant at Nitro, W. Va. For this service he was awarded a certificate of merit by the Secretary of War. During these days of feverish War construction, Professor Tucker had with him a favorite gray cat which he often said saved him from loneliness during the long periods away from his family.



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**NORTON COMPANY, WORCESTER, MASS.**

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## RUBBER AND LIFE

(Continued from page 174)




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## Samson Cordage Works

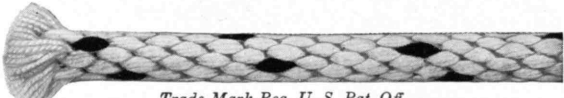
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Mills at Shirley, Mass., Anniston, Ala., and Icard, N. C.

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The Brownian movement is extremely active in a water mixture of rubber latex. Since the ultraviolet microscope was requiring an exposure of ten seconds, the images of the moving particles would show up as blurred blobs or streaks. So Lucas added seven per cent of salt to the ten centimeters of distilled water, and then placed three to five drops of latex in this slightly saline solution. The effect of the ionized atoms of salt is to stop or slow down the Brownian movement of the latex particles, and it was through this scheme (often used by microscopists) that the rubber motes were made to sit for the photographer. A drop of the solution was placed on a quartz slide, and this was covered with a quartz slip which was sealed by an edging of vaseline-olive oil, delicately touched on with a camel's hair brush. In the course of a few minutes the motion of all but a few of the very small particles had subsided, and it was possible to proceed to the photography.

But first the objective must be focused. This is begun with visible light, a beam of green from a mercury lamp. When the preliminary focusing is accomplished, the searcher eyepiece is swung into position, the visible light turned off, and the invisible ultraviolet turned on. A beam of a single wavelength is used (2,573 angstroms). Its revelations are invisible, of course, but it causes certain features to fluoresce into visible radiation, and by means of this fluorescence the finer focusing of the ultraviolet is accomplished. When once the image is in focus in the searcher eyepiece, it will also be in focus approximately 30 centimeters above — the position of the camera, which next is swung into place there, ready for action. By these means Lucas has taken many photographs of different samplings of the two specimens of latex. His pictures are distinct and consistent; yet they are at variance with ideas of the fine structure of rubber held by the experts.

It has been currently taught, for example, that the minimum size of rubber particles is about half a micron. Lucas concludes from his photographs that only ten per cent of the particles are that large, the overwhelming majority being far smaller and ranging downward to such fineness as to measure, in the smallest specimens, only .092 micron across. A micron is about forty-millionths of an inch; therefore, it would take more than 276,000 of these smallest photographed particles to make a row an inch long. Whether this be the limit, whether with finer resolution yet smaller particles might be photographed, we can only conjecture. The average size of the particles photographed is .26 micron, and this is separately true of both the Malayan and the Sumatran latex.

Lucas' photographs also challenge current ideas on the shape of the rubber particles. It has been thought that they were pear-shaped, and there is microscopic evidence for this idea; but almost all the particles recorded in Lucas' study are spherical, though of varying sizes. A few of the larger particles (measuring up to two microns in length) are pear-shaped. However, when these were subjected to Lucas' technique of "optical sectioning," it appeared that (Continued on page 190)

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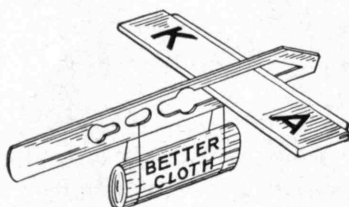
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## RUBBER AND LIFE

(Continued from page 188)

most of the oblong bodies represented the combination of a smaller particle attached to, or in process of merging with, a large particle.

Optical sectioning is a rare technique which seems to belong only to the ultraviolet microscope. It is a consequence of the fact that depth of focus for these rays of short wavelength is inappreciable. For practical purposes the plane of focus may be regarded as a geometrical plane, a flatland. Change the focus by as little as one-quarter micron (about one hundred-thousandth of an inch), and it is as though you had sliced a cross section of the object at that depth. Turn the screw enough to shift the focus by another quarter micron, and you see a section of what lies within the object at the depth of another hundred-thousandth of an inch. What is above and below the plane of focusing is completely invisible; the rays pass through it as through so much transparency and show only what lies in the precise plane of the optical section.

In this way Dr. Lucas found it possible to explore a particle from top to bottom in successive steps, without rupturing or mechanically disturbing the particle. Its image photographed as a slice through the globule, the edge or outside portion of the image appearing as a dark, encircling envelope and the inside as a transparent substance. It was by optical sectioning, too, that he discovered, at certain stages of his sectioning of a large particle, the presence of an attached, smaller particle which suggested an explanation of the pearlike shape of some of the bodies.

Of what substances are these rubber globules composed and in what arrangement? This is a chemical problem, and Dr. Kemp tackled it. By resort to a series of reagents he removed all traces of the fluid medium or sap serum in which the particles float, and broke down the latex particles into their constituents. The preponderant constituent is hydrocarbons which exist in the form of large molecules with molecular weights of 150,000 to 200,000 each. By far the greatest bulk of these hydrocarbons is a semiliquid mass which fills the interior of the globule. It is known as sol rubber hydrocarbon. Mixed with it is about ten per cent of water and about one per cent of sterol bodies. Surrounding and inclosing the more fluid interior is a thin layer of a tough, elastic substance — gel rubber hydrocarbon. This gel rubber is the skin of the sol rubber mass within, but it is not alone. It is fortified by an adsorbed layer of protein molecules which cover the entire globular envelope. As an outermost coating — an overcoat — there is a surrounding film of soapy or fatty material which changes from time to time.

Thus, the elementary particle of rubber latex is itself a fairly complex structure, comparable in certain features to a small biological cell. Just as the wall of the living cell consists of several membranous layers, so is the envelope of the latex globule a series of overlaid films of different materials. And there is evidence that the protein film surrounding the rubber hydrocarbon exercises a selective function. Apparently it is able to shut out water after the normal (Continued on page 192)

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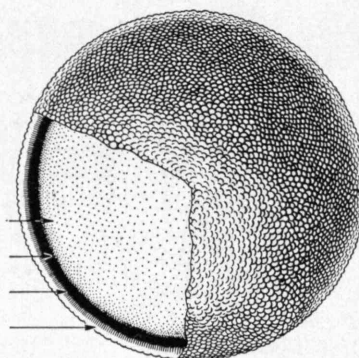


## RUBBER AND LIFE

(Continued from page 190)

STRUCTURE OF  
RUBBER LATEX  
GLOBULE

SOL RUBBER HYDROCARBON  
WITH STEROL BODIES & WATER  
GEL RUBBER HYDROCARBON  
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ten per cent, or thereabouts, is reached, for it has been observed that when this protein coat is broken, water from outside pours in until the interior content is a little over 20 per cent water. Presumably this is the limit, for saturation does not proceed beyond this proportion. Dr. Kemp is inclined to think that the water does not combine with the internal substances to form a hydrate, but that it is mechanically held — that in some unexplained way the molecules of water remain intact, diffused among the larger molecules of hydrocarbon and sterol.

Computing from the average weight of the latex globule and taking into account the distribution of particles in one gram of latex of the usual 40 per cent dilution, Dr. Kemp finds that the number of particles in a gram is 7.4 times  $10^{12}$ . A gram measures in volume about one cubic centimeter, and the total surface area of the millions of millions of particles which teem in that space is considerably less than one square foot (actually about 157 square centimeters). The thickness of the protein film, which seems to determine what gets in and what is shut out of the globule's interior, is .00095 micron. It is in submicroscopic dimensions that we must reckon here — dimensions that are of the order of those of the mysterious biological units: viruses, bacteriophages, and genes.

There is another behavior of the latex that led Lucas to try still another technique. I have mentioned that some of the pear-shaped bodies appeared in the optical sectioning as a combination of a large globular particle and an attached, smaller globular particle. Some of the photographs showed additional details. They revealed a certain order or regularity in the positions of detached particles relative to one another. Sometimes there was a small particle quite separate but seemingly the attendant of a large one. Then there were instances of several in a row, a gradation of half a dozen, ranging from a large globule at one end to a very small one at the other. What did these apparent orientations mean?

To investigate this problem Lucas turned to the ultra-microscope, quite a different tool from the ultraviolet instrument. This apparatus is designed especially for the study of colloids, for observation of their characteristic particle movements. The quartz plate on which the specimen is to be mounted contains a circular depression or cell. In this the colloidal liquid is placed. It is then covered with a thin quartz slip which rests on the sup-

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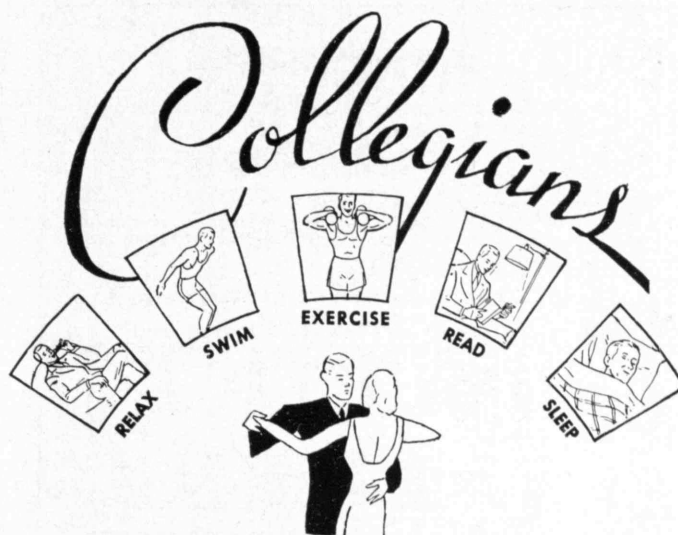
porting sides of the cell and exerts no pressure on the liquid beneath. Consequently, any motions that take place within the liquid are phenomena of the liquid itself and are not artificial effects imposed from above. If particles have satellites, Dr. Lucas wanted to see how the satellites move in relation to the larger bodies. If particles line up in graded columns, again there was a curiosity as to their relative motions.

The ultramicroscope uses visible light. It does not show details of the fineness revealed by the ultraviolet microscope. However, since its light (from a full arc) is not reflected from below, but strikes the object from the side, it shows the colloidal particles as bright spots against a dark background. These microcosmic constellations lend themselves to a rapid photography, and this is what Lucas wanted. To the ultramicroscope he adjusted a camera which could be made to take a series of 16 photographs, spaced five seconds apart, each snapped in the 50th of a second. Thus the film would provide a slow movie of 80 seconds of colloidal behavior within the drop of fluid imprisoned in the quartz cell. The specimen was prepared without use of any saline solution such as was employed in the ultraviolet photography, for there was no desire here to slow the particles; the purpose, rather, was to allow them to move according to their nature and to snap a photograph of their positions at five-second intervals.

In order to insure freedom of motion the quartz cell and slip must be clean; so part of Lucas' work is a meticulous dish washing. First he washes the quartz parts in alcohol and water, then he scrubs them in lens paper, followed by a cleaning with the air syringe. Next the parts are mounted in a platinum loop and held for almost five minutes in an almost boiling solution of sulphuric and chromic acids. After that comes a washing in tap water, then in distilled water, a final washing in alcohol, and at last the drying in flame. The whole cleansing sequence takes 30 minutes, and every step is indispensable. Once Lucas omitted the washing in distilled water, and when he installed his colloidal drop he found that microscopic particles clung to the sides of the quartz and there was no Brownian movement. When everything is adequately clean, the particles can be seen to move in continuous agitation for 24 hours and more.

And how do they move? The pictures taken five seconds apart show unmistakable examples of miniature planetary systems—small particles in revolution round larger particles, or at least swinging in the arc of an incomplete orbit. They show motions of repulsion, followed after a while by motions of approach, climaxing in a merger of the approaching bodies. Aging seems to have an effect of accelerating the processes of merging. Measurements show that in two-month-old latex the average size of the globules is nearly half again larger than the average size of fresh latex.

The particle of rubber latex is known to have a negative electrical charge; but just what forces control the attractions and repulsions, the revolutions or partial swings or gyrations, and the final approaches and mergers are questions for deeper research into colloidal mechanisms. That it is research of the most fundamental kind seems hardly open to question when we remember that our living processes are (*Concluded on page 194*)



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## RUBBER AND LIFE

*(Concluded from page 193)*

colloidal. In these interchanges and relationships of the rubber motes we may see analogues, perhaps even duplications, of the interchanges and relationships that occur in protoplasm. The behavior of malignant growths, of degeneration and slowing down with age, of stagnation and death, may have their counterparts, their explanations, their clues to control, in the nonliving colloids. And of these, assuredly rubber latex has shown itself to be a particularly apt and responsive material for experiment.

The experimenting will continue. Dr. Lucas is now planning a deeper attack in which he hopes to adapt ultraviolet illumination to the ultramicroscope. If this plan succeeds, it should multiply fourfold his power of seeing into this teeming microcosmos.

## BIG BOATS BOOM

*(Continued from page 177)*

probably grow one answer to the new specifications. The drawing that is shown here is far from final, but it does show something of what we may expect from the plant on the shores of the Chesapeake. Here are aerial comfort and luxury that would have been thought fantastic but a few years ago. The author has crossed the Caribbean in Commodores, has sampled the Bermuda run on both S-42 and Short *Cavalier*, has cruised in the China Clipper, but is anticipating, no end, a game of mid-Atlantic ping-pong on the sports deck of some such super ocean transport (see page 175) in the not-too-distant future!

One interesting by-product of Martin's work with big boats is the use of the flying scale model to check water and air performance before final construction at full scale. No innovation is the use of scaled-down models for the purpose in wind tunnels and in towing basins, but now, with ships growing to really large dimensions, a quarter-scale model may be built that will carry a human pilot and an observer, a two-place flying laboratory. One such model (see page 176) has actually been built and is now being flown daily at the Baltimore plant. It is powered with a six-cylinder, air-cooled, inline engine mounted in the hull, with two propellers driven through a system of V belts and pulleys. Two pilots sit in tandem. Essential changes in hull or wing shape that would tie up a full-scale ship many weeks and cost a great deal of money may be made on the model in a matter of hours and for a few dollars. So far, the model has proven well worth its cost.

While Easterners have been at work on their big boats, the Westerners have not been idle. Nearest to actual completion of all new boat projects for United States operators is Boeing's Model 314 (see page 176). Six are under construction for Pan American, the first of which will probably be test-flown in late winter or early spring of 1938. It is the first machine designed and equipped specifically for passenger carrying across the Atlantic. Its accommodations are of the same luxurious order as those sketched for the larger ships shown here—

with, except that the double-deck feature applies only to the flight bridge and crew quarters. Its wing span is 152 feet; its gross weight, 82,500 pounds. Its full 6,000 horsepower is available for get-away, and, with little over half its rated power, it is expected to cruise in the neighborhood of 160 miles per hour. Each of its four main fuel tanks holds 600 gallons of gasoline, is nine feet long, and approximately three feet in diameter. The ship's range of operations is normally over 4,000 miles, enough for the longest overwater hop, with some to spare.

Boeing hasn't said much, as yet, about plans to meet the new P.A.A. specs, but a visit any day to the huge engineering department in the Seattle plant easily gives rise to the suspicion that, when March 15 rolls around, Boeing will have something definite to spread out on the table for the Technical Committee's consideration.

The long hop from Seattle down to San Diego is well worth while to look in on another active big-boat builder, Consolidated Aircraft. Since 1928, Consolidated patrol boats have figured prominently on navy equipment rosters, have hung up many notable long-range records recently in the name of "routine transfers of equipment" from navy base to navy base. And only last month the Navy took delivery on a Consolidated "flying battleship," the *XPB2Y-1*, similar in size to Sikorsky's project referred to above. But although Major Fleet's boys have been specializing pretty much on naval craft, they, too, have a few really big commercial flying-boat projects up their sleeves, doubtless to be brought forth when new bids are opened. In fact, they have already disclosed their hand to a degree in releasing some preliminary studies of a 110,000-pound boat, of which a sketch or two are reproduced on pages 176 and 177. Like all the other "artist's conceptions" here presented, they represent no final answer, indicate only a trend. What with cozy bar, large dining saloon, luxurious lounges and cabin accommodations, the sketches show the extent to which the superliner of the air may compete for traffic with the superliner on the water in the not-too-distant future. For the technically minded, the following excerpts from Consolidated's specification sheets: span, 185 feet; wing area, 2,911 square feet; take-off horsepower available, 6,000; rated power (sea level to 10,000 feet), 4,800 horsepower; wing loading, 37.8 pounds per square foot; power loading, 22.9 pounds per horsepower; useful load (including 54 passengers and their luggage at 10,800 pounds, cargo at 1,495 pounds, fuel at 37,500 pounds), 54,495 pounds; weight empty, 55,505 pounds.

Although the Douglas Company at Santa Monica, Calif., so far has built no flying boats larger than the current twin-engined Model DF (95-foot span, 1,700 horsepower, 28,500 pounds gross), it seems only fair to assume that their engineers are burning midnight oil and heating up slip-sticks over the latest requirements. Their long-standing interest in larger and larger airplanes, coupled with years of experience building smaller ships for the Navy, will undoubtedly make them a serious competitor for P.A.A.'s new business — if Donald Douglas ('14) "chooses to run." But, so far, no word has leaked out to indicate what form the Douglas proposals will take.

(Concluded on page 196)



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## BIG BOATS BOOM

*(Concluded from page 195)*

Thus, as far as we can see at the moment, the shape of things to come; thus, the pattern of big-boat building as it is taking form on this side of the Atlantic. Although pressure for development is coming from the competition of rival operating companies and from competition among designers and manufacturers, the real spur to present feverish activity is coming from without. Other countries beside our own have long since recognized the importance of domination of the ocean airways. England is reported to have laid down new boats far and away outstripping the Short Empire types in size and in performance. France has already tried one more or less unsatisfactory experiment in the huge *Lieutenant de Vaisseau Paris*, but, undeterred, is pushing ahead with bigger and better Liorés and Bleriot. Germany is known to have transatlantic types under construction to supplement the catapulting types flown experimentally in 1936 and 1937. What Russia is doing is anybody's guess, but the fact that the Soviets purchased Martin's Ocean Transport indicates more than passing interest. And other countries also are keeping their eyes on potential colonial trade routes that will call for extensive water flying.

Clearly, the competition is already keen and will become more so. But judging from this brief survey of our own progress, it is safe to say that American aviation is already well out in front and will stay there. We are on the threshold of another great era of maritime development when clippers flying the American flag will touch all harbors of the world. We must revise the terminology but slightly, for 20th Century trade will be carried on American wings, not in American bottoms.

## THE ENGINEER IN INDUSTRIAL RELATIONS

*(Continued from page 180)*

The success of the Princeton section has resulted in the spread of the movement in recent years. It was found that while Princeton was able to keep in touch with a substantial number of national concerns outside the New York, New Jersey, and Pennsylvania area, it was able to perform its principal service to industry in these three states only. It was Mr. Hicks's hope, therefore, that similar sections might be established in five or six key institutions in different parts of the United States. Two years ago the University of Michigan decided to follow Princeton's lead by setting up a specialized industrial relations section. A little over a year ago a section was also established at Stanford University in California and another section has more recently been established at Queens University in Canada. All of these extensions of the Princeton plan, including M.I.T., have been undertaken at Mr. Hicks's suggestion and with his cooperation.

The new section which we are organizing in the Department of Economics at Technology to specialize in the New England area is the latest move in this development. While each of the sections will undoubtedly

develop along somewhat different lines, the Technology Section will function in close coöperation with those already in existence, benefiting from their experience and making use of the information they have compiled.

We plan to build up at Technology a first-class library of current material in the field of industrial relations. This will require the coöperation of industrial, governmental, and trade union organizations. We hope, for example, to collect from the leading industrial concerns in the United States all the material which they have available on industrial relations questions. This will involve the collection of pension plans where they exist, written labor policies, collective-bargaining agreements, foreman training programs, profit-sharing arrangements, and so on. We expect to supplement this with samples of industrial relations material from the smaller companies in various sections of the United States, and we hope to build up a very complete record of material for the various New England industries. Similarly, on trade unions, we hope to collect information on their written agreements with employers and on whatever other activities they are willing to furnish information. A number of the more progressive trade unions have established, or are now establishing, research organizations of their own, and we shall endeavor to keep in close contact with their activities. Our library will also contain all the significant books and periodicals published in the field of industrial relations, and will be so classified and indexed as to be readily available

for the use of business executives, labor officials, and research workers. The material will be used to answer specific inquiries from interested persons throughout the country.

As a research bureau the Section will prepare reports, by means of correspondence and field investigations, on labor problems of general interest. The range of subjects covered will include such questions as accident prevention, adjustment of disputes, age limitations, apprentice training, bonuses, child labor, collective bargaining, discharge, employee representation, employment methods, fatigue, hours, housing, insurance, job analysis, labor turnover, overtime, pensions, profit sharing, promotion, stock ownership, coöperative credit, unemployment, and wage determination. We plan to initiate our activities by making a survey of industrial relations practices in New England by industries. This will be undertaken by means of personal interviews and questionnaires. The information obtained on any particular company will be kept confidential if that is requested. With this background we should be in a better position to determine what special studies to undertake. The Section will also engage in research of a more fundamental character on questions affecting industrial relations in the fields of economics, sociology, and psychology.

We hope that the Section will have important educational advantages to our students. All students at Technology take a general course in economics and many of them are required to (*Concluded on page 198*)

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**THE ENGINEER IN INDUSTRIAL  
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*(Concluded from page 197)*

pursue special studies in industrial relations. To have at hand a wealth of factual material, with specialists available for consultation, should be of great assistance in bringing the realities of employer-employee relations into the educational experience of Technology students.

Another activity of the Section will be an annual conference of company executives and staff members responsible for, or engaged in, industrial relations work. The conference now being conducted annually by the Princeton section has been extremely popular, and in recent years Princeton has had to turn away a large number of applicants. At Princeton, subjects of current interest in the field of labor have received consideration, using the method of brief presentations by qualified leaders followed by informal group discussions. The Princeton meetings have always been closed to the general public and have never been reported. While we expect to follow this precedent generally at M.I.T., we plan to open the evening sessions to the public.

In building up the staff of the Section, we are anxious to bring together a group of men with varied background and experience. We feel this will enable us to obtain a greater understanding of industrial relations problems than if we had men who had specialized only in one phase of the subject. We have now on our staff, connected with the Section, a sociologist and a psychologist, in addition to our regular economic staff. We are also anxious to strengthen the Section with men who have had very considerable experience in the field. In this connection we are particularly fortunate in being able to announce that by a special arrangement with the American Optical Company we have been able to borrow for a year, on a part-time basis, Royal Parkinson, who has been personnel manager for that company for 20 years. He will be directly associated with the Section. We are conscious of the danger that a Section of this sort will fail to fulfil its function effectively if it does not succeed in keeping in constant close personal touch with practical experience in industrial relations. We are hopeful that by building up a group of research workers who, in addition to their academic background, are thoroughly familiar with industrial relations as they are practiced today both in this country and abroad, our new Section will be in a position to be of real service to the community.

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# TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

## *Science in Industry*

¶ Speaking in the symposium on science and industry at the annual meeting of the National Association of Manufacturers in New York City on December 8, KARL T. COMPTON, President, cited the contributions of science in the creation of industrial prosperity and high standards of living as a factor comparable to legislation, labor relations, and monetary policy in its influence on the progress of civilization.

Shortly after this, Technology's President, addressing members of The Technology Club of New York, offered the country a three-point program for progress: (1) freedom from restrictions of legislation; (2) clarification of government objectives by acquainting the nation with what the rules of the game will be; (3) active advancement and application of science to bring industry into new fields.

Continuing at the December 8 meeting, Dr. Compton traced the evolution of new products from discoveries in pure science followed by invention, to final engineering development. Emphasizing the fact that many industries are now making products unknown a few years ago, Dr. Compton said: "Nothing is more certain than that science and engineering can accomplish similar miracles of social and industrial progress in the future if given similar financial support in the same democratic atmosphere of freedom of initiative."

A group of members of the National Association of Manufacturers and the American Institute of Physics, Dr. Compton added, have formed a joint committee for the purpose of fostering those conditions under which science may be of best service to the country, with particular reference to its relationship to the manufacturing industries. Discussing the rewards of industrial research, Dr. Compton said: "May we define the proper scope of scientific research in industry as that which shows reasonable promise of producing better products or desirable new products which can be made and sold with profit, or of reducing the cost of existing products. It is, therefore, quite reasonable for industrial organization to conduct research which has a

specific goal of economic interest to the industry with reasonable expectation of early results. . . ."

## *We Hold in Esteem*

¶ MICHAEL J. AHERN '06, member of the Society of Jesuits, who not only aided in the production but also acts as narrator of an excellent religious film, "Monastery." At its Boston premiere, proceeds went to Father Ahern's fellowship fund to advance the study of seismology at Weston College.

¶ CHARLES A. KRAUS '08, professor of chemistry and director of chemical research at Brown University, who has been elected president of the American Chemical Society for 1939.

¶ THOMAS G. CHAPMAN '09, head of the department of mining engineering and metallurgy at the University of Arizona, who became dean of that university's graduate college in December.

¶ JOHN E. BURCHARD '23, Vice-President of Bemis Industries, Inc., who was recently appointed to a sub-committee of the construction and civic development department committee of the United States Chamber of Commerce.

¶ FREDERICK J. ADAMS, Assistant Professor of City Planning at M.I.T., who has been appointed editor of *The Planners' Journal*, official organ of the American City Planning Institute.

¶ CARL BRIDENBAUGH, Assistant Professor of History at the Institute, who received the distinguished Justin Winsor Prize awarded by the American Historical Association for the best book on the history of the Americas written by a young scholar.

## *Sloan Foundation*

¶ ALFRED P. SLOAN, JR., '95, chairman of General Motors Corporation, in donating, recently, securities valued at ten million dollars for the expansion of a foundation which bears his name, stated that this foundation "proposes to concentrate, to an important degree, on a single objective; i.e., the promotion of a wider knowledge of basic economic truths generally accepted as such by authorities of recognized standing. . . . While the Alfred P. Sloan Foundation may undertake or pro-

mote activities on its own behalf, it will give preference to encouraging, through financial grants and otherwise, such useful agencies as already exist. . . ."

## *Activities in New York*

¶ LESTER C. HAMMOND '02 has accepted the position of chief engineer of sewers and highways for the borough of Manhattan, and two other Technology men who have also received appointments from the new President of the borough are WALTER D. BINGER '16 and CHARLES W. WILLIAMS '15, as commissioner and assistant commissioner of borough works, respectively.

## *Delivered at a Meeting of*

¶ The American Association for the Advancement of Science, Indianapolis, Ind., December 28, CHARLES A. KRAUS '08, the 14th annual Josiah Willard Gibbs Lecture, "The Present Status of the Theory of Electrolytes." Dr. Kraus has been mentioned elsewhere on these pages as president-elect of the American Chemical Society.

¶ The American Chemical Society, division of physical and inorganic chemistry, symposium on the less familiar elements, Cleveland, Ohio, December 27 to 29: ARTHUR A. BLANCHARD '98, "The Carbonyls of the Less Familiar Elements"; RALPH C. YOUNG '29 and JOHN W. IRVINE, JR., '35, "The Reduction of Perhenates"; JOHN W. IRVINE, JR., '35, "The Synthetic Radioactive Isotopes of the Less Familiar Elements"; WALTER SCHUMB, Staff, and H. IRVING CRANE '33, "The Organometallic Compounds of Indium."

¶ The American Chemical Society, organic division, Richmond, Va., December 28 to 30, AVERY A. MORTON '24, "Organosodium Reagents in the Wurtz Reaction."

¶ The American Chemical Society, division of industrial and engineering chemistry, symposium on drying and air conditioning, Philadelphia, Pa., December 27 to 28: L. H. BAILEY '15, "Vacuum Drying with Agitation"; R. V. KLEINSCHMIDT '18 and B. B. FOGLER, "Technical and Economic Aspects of Spray Drying"; M. C. MOLSTAD '23, "Rate of Evaporation

THEODORE W. ROBINSON  
208 SOUTH LASALLE STREET  
CHICAGO

December 29, 1937

Dear Doctor Compton,

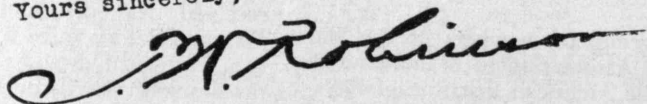
As a slight testimonial of my interest in the outstanding work that you are doing for the cause of education in general and for the Massachusetts Institute of Technology in particular, I am enclosing herewith my check toward the Alumni Fund.

I want to say that I am entirely in sympathy with the objects and sentiments expressed in your late letter to me. As I look back upon the time when I was a student at Technology I am glad to realize the forward steps that have been taken in Technology's curriculum for the broadening of its student body. There can be no question but that scientific training is as good if not a better background for the development of executive leadership as that represented by a study of the classics and the humanities, but it is obvious that the former environment at Technology did not lend itself with its specialized training to that wider influence and training that is needed to make a well rounded man.

I want to take this opportunity of congratulating you upon your recent presentation of Technology's problems and accomplishments. In my opinion Technology has suffered in the past in too infrequent contacts between its far-flung alumni and its official staff.

With warm regards, and with best wishes to you and yours for the coming year, I am

Yours sincerely,



Dr. Karl T. Compton,  
Massachusetts Institute of Technology,  
Cambridge, Massachusetts.



from a Free Water Surface to a Transverse Air Stream"; T. K. SHERWOOD '24, presided at the Monday afternoon session; E. R. GILLILAND '33, "Fundamentals of Drying and Air Conditioning"; C. HADLOCK '33, C. B. Shepherd, and R. C. Brewer, "Drying of Materials in Trays — Evaporation of Surface Moisture."

¶ The Boston Society of Civil Engineers, sanitary section, November 12, A. B. MORRILL '09, "Some Features of the New 420-Million-Gallons per-Day Detroit Sewage Treatment Works."

¶ The Northwest Mining Association, Spokane, Wash., December 4, C. J. TRAUERMAN '07, annual report as president.

¶ The National Metal Congress, Atlantic City, N. J., October 18 to 22, the following presented papers: R. H. SWEETSER '92, "Combined Carbon; the Controlling Factor in Quality of Basic Pig Iron"; T. C. MERRIMAN '09, "Notes on the Annealing of Nickel Silver Wire in Coils"; M. A. GROSSMANN '11, "A Review of Some Fundamentals of Carburizing"; J. T. NORTON '18, "X-Ray Methods of Studying Stress Relief in Welds"; W. H. BASSETT, JR., '19, "Production of Copper from Mine to Mill"; R. H. ABORN '20, R. F. MILLER '34, and others, "Influence of Heat Treatment on Creep of Carbon-Molybdenum and Chromium-Molybdenum-Silicon Steel"; A. G. H. ANDERSEN '21, and E. R. Jette, "Notes on Microstructures and Hardness of Alloys Consisting Essentially of Iron, Chromium and Silicon," also, "An X-Ray Study of the Effects of Adding Carbon, Nickel, or Manganese to Some Ternary Iron-Chromium-Silicon Alloys"; A. B. KINZEL '21 and G. S. MIKHALAPOV '26, "Low Alloy Steels"; E. COOK '22, five lectures on "Open-Hearth Steel Making"; C. S. SMITH '26, "Sulphur, Selenium and Tellurium in Copper-Base Alloys"; H. R. BULLOCK, Staff, "High Speed Motion Pictures of Flame Cutting."

¶ Harvard School of Public Health, December 14 and 15, J. A. TOBEY '15, two lectures on public health law. Dr. Tobey spoke on this subject also at the Yale School of Medicine and before the graduate seminar in the Department of Biology and Public Health at the Institute.

¶ National Association of Cost Accountants, Boston chapter, November 5, J. F. PIERCE '22, "Job Analysis for Office Work."

¶ Stonington, Conn., 100th anniversary of the opening of Connecticut's first railroad, November 10, C. E. SMITH '00, commemorative address.

## Written

¶ By ALONZO J. HAMMOND '91, "Why a Public-Works Department?" *Engineering News-Record*, November 11.

¶ By WILLIAM T. HALL '95, co-author with Treadwell, ninth edition of "Qualitative Analysis." This revision represents a complete rewriting of the book, with much new material added, particularly procedures for semi-micro analysis.

¶ By BRADLEY STOUGHTON '96 and ALLISON BUTTS '13, "Engineering Metallurgy," third edition, McGraw-Hill Book Company, Inc.

¶ By FRANK B. JEWETT '03, "Some Fundamentals in Standardization — Thirty Years in Retrospect," *Industrial Standardization*, December. This paper was originally delivered as an address at the annual meeting of the American Standards Association. Mr. Jewett, who is vice-president of the American Telephone and Telegraph Company and was active in the early development of the national standardization program, defines standards as tools for progress: "To me a proper engineering or industrial standard is a temporary statement which includes all that is really essential of proven current knowledge to define the thing standardized. It is a specification which can be met in current commercial practice and a tool by which the art can progress. It carefully excludes everything which is non-essential in order to insure maximum latitude alike to the developer and user. In a word, it is a common meeting place for purchaser and seller with no signs of *caveat emptor* about."

¶ By PAUL KELLOGG '11, "The Mathematics of Management," originally an address, on October 15, before the Montreal chapter of the Canadian Society of Cost Accountants and Industrial Engineers.

¶ By MARK REED '13, "Yes, My Darling Daughter," a comedy that enjoyed a lively season in New York.

¶ By C. C. DAVIS '14 and JOHN T. BLAKE '24 as editors, "Chemistry and Technology of Rubber," American Chemical Society Monograph No. 74, Reinhold Publishing Corporation. Several chapters in this monograph have been written by Technology men: "Physical Testing and Specifications," ARTHUR W. CARPENTER '13; "Literature on the Chemistry of Rubber," C. C. DAVIS '14, one of the editors; "Chemical Analysis of Rubber and Rubber Products," R. P. DINSMORE '14, R. H. Seeds, and H. E. Rutledge; "Fillers and Reinforcing Agents," CHARLES R. PARK '19, N. A. Shepard, and J. N. Street.

¶ By ELBRIDGE J. CASSELMAN '15, "Science Turns to Shaving," *Scientific American*, November.

¶ By JAMES A. TOBEY '15, "Education in Nutrition by Private Agencies," *American Journal of Public Health*, November.

¶ By SAMUEL CHAMBERLAIN '18, "Beyond New England Thresholds," a portrayal of the fascinating story of early American interiors, Hastings House.

¶ By CLINTON B. CONWAY '24, "Relighting the Walters Art Gallery, Baltimore, Maryland," originally a paper before the 31st annual convention of the Illuminating Engineering Society, September.

¶ By RICHARD BELL '34, "Keep It Clean!" *Excavating Engineer*, September.

¶ By KARL T. COMPTON, President, "Education and Business Leadership," *Mechanical Engineering*, November.

¶ By WILLIAM C. GREENE, Staff, "A Deeper Root," Little, Brown and Company.

¶ By OLIN INGRAHAM, Staff, "Diary of a Search for Truth in Russia," *Mechanical Engineering*, September.

¶ By RONALD H. ROBNETT, Staff, "Working Methods for Planning and Controlling Profits," *Mechanical Engineering*, November.

## Education — Broad or Deep?

¶ In concluding an address at the Teachers College, Columbia University, recently, PER K. FROLICH '23, spoke as follows: "There may be some question as to whether . . . some of our engineering schools do not have a tendency to err on the side of too much specialization at the expense of pure cultural subjects. While a highly specialized course as a rule appeals to the young student who is rearing to go places and get a head-on start in his chosen profession, some of us begin to wonder, as we grow older, whether we are properly equipped to enjoy the finer things in life. From our earliest years our pace has been geared up to such a high pitch that there has been little room for cultivation of the art of living. And perhaps we have not become particularly good citizens, as witness our lack of participation in politics and other civic activities."

"If specialization were justified in any walk of life, it certainly should be in science and engineering. But what does industry look for when hiring college graduates, be they bachelors, masters, or doctors? First and foremost: a broad training in the fundamentals and in the principles of



applying scientific knowledge, coupled with a reasonably good scholastic standing. Next come personality, leadership, interest in outside activities, and all those abstract qualities which add up to make for a well-integrated individual. The smaller organization may perhaps be looking for a young expert, but the larger industrial concerns seem to be far more interested in men with a broad training. This type of employer prefers to take care of the specialized training himself, once he has found a young graduate with the proper foundation on which to start erecting the superstructure.

"Let me quote the following from an address given by Dr. R. E. Wilson ['16] at the centennial celebration of the American patent system. Dr. Wilson is a highly successful oil executive who started his career as a college professor: 'Thirty years ago a man with a bachelor's degree from a good university could carry out advanced research without serious competitive handicap. Today a man with even a doctor's degree is considered to be inadequately prepared to do outstanding research in many branches of science. If this process continues, our men will pass their prime, so far as their inventive faculties are concerned, before they reach the level where they can begin pioneering work. Some would remedy this by earlier and more intensive specialization in the training of our scientists, but I feel that this would be a serious mistake, as our scientists need to know more, rather than less, of the social implications of their work, and only a broad training can be an adequate foundation for a life devoted to research.' He adds that 'this situation can be improved by more efficient methods of education, particularly in the elementary and high schools, for individuals who show real promise of scientific ability.'

"But when everything has been said about *what* to teach, there still remains the equally important questions of *how* it is being taught and *by whom* it is being taught. These things may not be part of our discussion today, but they bring to mind a statement made some ten years ago by Professor W. K. Lewis ['05] of M.I.T. In closing his discussion before a conference on educational policies held here in New York City, he said: 'Remember, gentlemen, that teaching is largely a matter of contact between personalities.' Long after we have forgotten the details of what we have been taught, there are two things which remain: first a certain amount of general knowledge

such as one expects to find in a well-educated individual and, second, a memory of one, two — perhaps even of three — outstanding teachers with whom we have been fortunate enough to come in contact during our school and college years, and who by their example and inspiration have helped to mold our characters and thereby perhaps have done more to equip us for a useful life than anything specified by the curriculum."

## DEATHS

\* Mentioned in class notes.

¶ FRANCIS D. FISHER '69, December 24. Born in Westboro, Mass., in 1847, Mr. Fisher spent his early years on his father's farm, attended school and high school, and at the age of 16 was employed by a railroad. In 1865 he entered M.I.T. and, upon completion of his studies, became first assistant engineer on the Hoosac Tunnel, then the longest tunnel in prospect in the world. Later Mr. Fisher was in charge of the first elevated railroad north of Harlem River. It was through his perseverance that trains were kept running through the blizzard of 1888.

In 1869 Mr. Fisher married Sarah Elizabeth Dix, who died in 1912 leaving him with five children. He was retired in 1918, after an engineering career of 50 years, and built a home in Pasadena, Calif., where he lived until his death, the oldest member of the Class of 1869.

Mr. Fisher was a member of the American Society of Civil Engineers and the University Club of Pasadena.

¶ WILLIAM S. STEARNS '79, December 12. A native of Hamilton County, Ohio, Mr. Stearns was one of the nation's leading figures in the textile and cotton industry and was chairman of the board of Stearns and Foster Company, Cincinnati. He was born on a farm east of Reading and made his home continuously in Ohio except for brief periods when he worked in Pittsburgh as a civil engineer and with railroad companies in Nebraska.

Mr. Stearns was widely known in Cincinnati business, civic, and philanthropic circles. He was a member of the Wyoming, Ohio, Presbyterian Church, Wyoming Country Club, and the Queen City Club. He was instrumental recently in organizing a national bank for employees in the Lockland and Reading factory district.

¶ HENRY JOHN SCHLACKS '92, January 6. From the *Chicago Tribune* of January 7, we quote: "Henry J. Schlacks, pioneer Chicago architect who erected many of the city's Catholic churches, died yesterday in his home at 3240 Lake Shore drive. He was 70 years old.

"Born in Chicago, Mr. Schlacks was graduated from the Massachusetts Institute of Technology. Among the twenty-five Catholic churches, schools, and hospitals he built, his most elaborate work was St. Martin's church, 59th street and Princeton avenue. Other buildings include St. Mary of the Lake church, St. Ita's Church, St. Boniface school, and St. Anthony's hospital. . . ."

¶ ROSS F. TUCKER '92, December 26. The *Boston Transcript* of December 27 said: "Mr. Tucker was a pioneer in the development of concrete as building material, serving at one time as president of the Masters' League of Cement Workers. For his work in supervising war-time building projects for the Government he was awarded a certificate of merit. Born in Sacramento, Calif., sixty-nine years ago, he received his early education there and then was graduated from M.I.T. with the class of 1892. A year later, he founded the Aberthaw Company of Boston, a contracting firm. He later was actively associated with outstanding building projects in New York and other large cities. While in New York, he held several important positions in industrial organizations. He was a member of the American Society of Civil Engineers and Mechanics Institute. He leaves his wife and a son, Gordon F. Tucker, also an engineer." Professor Tucker came to the Institute in 1926 as head of the Course in Building Engineering and Construction under the Department of Civil and Sanitary Engineering, which position he held at the time of his death.

¶ MARTIN J. S. CROMWELL '93, July 14.

¶ CHARLES G. SARGENT '93, January 2.

¶ WILLARD T. CANNON '99, December 29.

¶ ALBERT H. B. ARNOLD '01, October 7.

¶ ELROY C. RIEBEL '04, February 21, 1937.

¶ LASLEY LEE '10, November 15.\*

¶ CHARLES P. RANDOLPH '10, November 30.\*

¶ J. TALMAGE WOODRUFF '17, December 18.\*

¶ DONALD A. ROBBINS '21, December 29.

¶ SCOTT P. HAWKINS '31, January 6.

# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### *Technology Club of Chicago*

Resounding through the years will echo achievements of that dinner on November 30 for Karl Taylor Compton. Into Cathedral Hall of the University Club of Chicago, Phil Moore '01, chairman, packed 222 dinner-suited, loyal, lusty Alumni, coming from distances — Milwaukee, South Bend, Peoria, Urbana, Rockford, Minneapolis, and New York. Pen Brooks '17 brilliantly guided after-dinner events. Arthur Curtis Willard '04, President of the University of Illinois, sketched early attempts at technological education. Then came Dr. Compton. Why try to type his story when print lacks power to transmit the personality! Let it be recorded that M.I.T. Alumni are of one spirit in high enthusiasm for Compton.

Of worthy mention at the speakers' table: Lonsdale Green '87, fosterer and founder of the Club; W. H. Bovey '94, Corporation member from Minneapolis; Henry Raeder '76, oldest Alumnus in the Chicago area; Robert Jordan '37, representing the youngest Class; and Gus Bouscaren '04, Chicago chairman of the Gymnasium Fund Campaign, who "just happened to be present." Cardinal and gray orchids to Gus for masterly and lovable equivocation: He appealed for dollars but he didn't appeal, or did he? (Answer: He appealed.)

Years rolled back to youth in Boston and Cambridge when prince of cheerleaders, Rad Stevens '17, roused out Tech yells and song, assisted ably by George B. Jones '05 and choir. Orchestra also was heard. And so to close — thanks and many thanks again be given to those who brought this light to shine for the Club: Phil Moore and his excellent dinner committee. — EDMUND G. FARRAND '21, Secretary, 1200 Old Colony Building, Chicago, Ill.

### *Technology Club of New York*

Described by speakers as the "largest alumni group ever assembled outside of Boston," and by far the most successful event in the history of the Club, the annual dinner was held at the Hotel Astor on December 9. Six hundred club members and Alumni filled the huge roof garden and anterooms of the hotel to capacity, to enjoy the dinner and to hear the distinguished list of speakers, headed by President Compton. Alfred T. Glassett '20, President of the Club, struck an auspicious note in his introductory words, when he said: "Next year the Club celebrates its 50th anniversary. To celebrate this event and to be prepared for the tremendous influx of visitors in

### *Are Technology Men Active as Alumni?*

*A resounding answer to this question is apparent in the adjacent club notes, as well as in the class notes that follow. Read the reports of the Chicago and New York dinners or of the many other Technology meetings reported here if you wish detailed proof of the upsurge in alumni spirit that is accompanying the Alumni Fund Campaign for better student recreational facilities.*

*As The Review pointed out last month, an index of the activity and interest shown by Alumni is the number of club meetings for which speakers were obtained from the Institute. In 1937 that figure reached the astonishing high of 98. All but four of the 64 alumni clubs in the United States were visited one or more times by representatives of the Alumni Association or the Institute.*

*The Review is proud of this rising tide of alumni interest. It is sure that Technology men are discovering that their loyal work is creating a more affectionate feeling of responsibility for the welfare of the Institute. It is sure that this aroused interest represents a new expression of that institutional spirit which is the bulwark of all great colleges. Technology men are demonstrating that an intelligent, sympathetic, and active loyalty to a great institution is one of the finest of all avocations.*

1939 for the New York World's Fair, many of our members and local Alumni have suggested that this is an appropriate time for the Club to take over a building of its own, providing club facilities more in keeping with the standing of the Institute in the collegiate field.

T. C. Desmond '09, state senator and former President of the Club and chairman of the Alumni Drive for the enrichment of student life, discussed the progress of the campaign and expressed his conviction that all Alumni would contribute to reach the final goal. — Discussing his work as a professor at Technology, Warren K. Lewis '05 cited the successful accomplishments resulting from the community of interest between administration, staff, and Alumni at the Institute, the success of which, he said, could be duplicated in the field of industrial labor relations if the principle of community of interest and not diversity of interest were recognized in the relationship between employer and employee.

In presenting President Compton to the audience, Gerard Swope '95 pointed to the Institute's present large enrollment

and to the high quality of this enrollment as indicated by the large number of applicants from which the entering class is selected. President Compton outlined the future plans at Technology, with special emphasis on the important additions to the personnel and research equipment of the Institute. In discussing the economic conditions of the country, he put forward a three-point program for the attainment of sound recovery. The points were: (1) freedom from burdensome legislative conditions; (2) friendly cooperation among industry, government, and labor; (3) advancement and development of practical applications of science to help industry enter new fields. — A moving picture, "Heat and Its Control," presented by George Dandrow '22 provided the entertainment for the evening. — ROBERT EMERY '34, Secretary, 22 East 38th Street, New York, N. Y. CONSTANTINE S. DADAKIS '34, Publicity Committee, 644 Riverside Drive, New York, N. Y.

### *Technology Club of Albany*

A luncheon meeting of the Club was held at the University Club on Monday, November 15. Our guests and speakers were Edwin S. Burdell '20 and Thomas C. Desmond '09, who spoke on "Present Conditions at the Institute" and "The Alumni Fund Campaign," respectively. Both talks were very informative, and those attending left with a better understanding of the aim and purpose of the Alumni Fund Campaign.

The following members were present: A. F. Allen '12, R. H. Allen '05, C. H. Anderson '27, H. M. Chapman '02, J. G. Fairfield '16, J. H. Finley '25, W. H. Hoar '26, C. A. Holmquist '06, T. W. Mackesey '32, C. W. Matthews '37, B. R. Rickards '99, E. H. Sargent '07, C. E. Smart '05, R. E. Walsh, Jr., '28, L. B. Wetmore '36. — REDMOND E. WALSH, JR., '28, Secretary, New York Power and Light Corporation, Albany, N. Y.

### *Dayton Technology Association*

On the evening of December 6, the Dayton Alumni and their families enjoyed a very pleasant get-together at the Engineers' Club. Dinner was served, after which B. Alden Thresher '20, now Director of Admissions at M.I.T., talked. Professor Thresher gave a very interesting outline of present-day activities at the Institute. He described the new buildings and equipment, as well as the need and location for the proposed gymnasium building, and finally the function and operation of the department on admissions. The meeting was then thrown open to questions and general discussion.

The following were guests of the Institute: E. H. Landis, superintendent of schools; A. E. Claggett, principal of



Oakwood High School; Jay W. Holmes, principal of Steel High School; Cory LeFever, principal of Stivers High School; D. D. Longnecker, principal of Fairview High School; E. C. Rowe, principal of Roosevelt High School; C. G. Scharkey, principal of Parker High School. — JOHN C. MORSE '14, *Secretary*, 114 Central Avenue, Dayton, Ohio.

### *Technology Club of Central Pennsylvania*

The Club held a dinner meeting at the University Club of Harrisburg on Thursday, November 18. There was a good turnout of Alumni — the distance prize going to the Lancaster group, I think. M. L. Grossman '26 came in from Pine Grove, but I believe that is not quite so far away as Lancaster. Karl T. Compton was our guest of honor and, except for a very brief introduction by the Honorary Secretary, was the only speaker of the evening. Dr. Compton is one of those *rarae aves* who excel both as speakers and as scientists. As a result, he was able to cover the scientific and construction advances being made at M.I.T. so that even the Secretary could follow him with ease and delight. (I can't say as much for the newspaper reporter who managed to garble the speech in the inimitable manner of his species.)

In closing Dr. Compton discussed plans for the new student recreational and sport facilities with the aid of lantern slides. As you know, the Alumni have undertaken the campaign to raise funds for the gymnasium, and I hope that every member of our Club will send his pledge card in the very near future. The evening closed with a regular Tech cheer which, though unrehearsed, made up in enthusiasm its lack of finesse. Those of you who were unable to attend missed a very enjoyable evening and will, I hope, be able to get to our next meeting. Meanwhile, send in those pledge cards. — WILLIAM M. DAVIDSON '26, *Secretary*, Bell Telephone Company, 210 Pine Street, Harrisburg, Pa.

### *Technology Club of Hartford*

The opening meeting of the season, held at the City Club on November 15, was honored by the presence of a distinguished delegation from Cambridge. Thirty-five members of the Club were on hand to greet the Alumni President, Marshall B. Dalton '15, accompanied by Ralph T. Jope '28, Secretary of the Alumni Advisory Council on Athletics, and Philip Peters '37, a graduate student. Speaking in turn, they presented a lucid picturization of the present deplorable lack of adequate recreational facilities at the Institute, and of the proposed building program to remedy the situation. The latter part of the meeting was taken up with a showing of two reels of motion pictures — one of Tech's dinghy fleet in action and the other taken at the T. C. A. freshman camp at Massapoag. Malcolm G. Wight '06, President of our Club, presided at the meeting.

The second meeting of the Club, held December 15 at the University Club, was attended by some 35 members. The guest and speaker of the evening, W. A. D. Wurts, Rensselaer Polytechnic Institute '24, presented an interesting story, illustrated by slides, of the new \$1,500,000 sewage-disposal system for the Hartford Metropolitan District, which has been under construction for several years and will soon be ready for operation.

City Engineer Ross (our Jack Ross '06), whose department executed all the design and supervised the construction of the job, spoke briefly at the close of the meeting, pointing out the pride which Hartford may take, not only in the fact that it will now have a modern sewage-disposal system second to none in any city of its size but also in the fact that few cities of its size would have engineering departments able to handle a job of this kind so completely. It is good to see Technology living in the work of her men.

The following men were present: G. U. G. Holman '88, E. Y. Stimpson, H. I. Wood '01, E. P. Tripp '04, M. G. Wight '06, R. J. Ross '06, A. R. Hunter '08, R. H. Mather '11, R. W. Davis '12, A. F. Peaslee '14, C. H. Chatfield '14, M. E. Hill '15, M. Knowlton '18, H. W. McIntosh '19, A. S. LaPenta '22, R. P. Schreiber '24, L. C. Smith '25, G. A. Fogg '26, E. C. Wheeler '26, G. H. Craemer '26, T. D. Green '26, B. G. Constantine '26, J. H. L. Giles '29, F. N. Dickerman '30, M. F. Burr '32, A. J. Minikus '33, W. H. Brothwell '33, L. J. Proulx, Jr., '36, M. S. Kendzur '37, A. H. Shulman '37, W. S. Wojtczak '37. — GEORGE A. FOGG '26, *Secretary*, 164 Wethersfield Avenue, Hartford, Conn.

### *Indiana Association of the M.I.T.*

The Association held its annual meeting on Friday, December 10, at the Indianapolis Athletic Club. Following a very satisfying and social dinner, the Association proceeded to change the date for the annual meeting to the month of September, so that officers appearing in the Alumni Directory will hereafter be those just assuming office. Batist R. Haueisen '23 and Richard L. Berry '30 were then unanimously elected president and secretary, respectively, for the term ending in September, 1939. All, including the retiring officers, felt that men of more recent Classes should take the wheel. The Association was unanimous in reaffirming Charles E. Locke '96 as its representative on the Alumni Council and wishes here to record its appreciation of his long service in its behalf.

After the current business was behind us, the remainder of the evening was given over to general discussion of M.I.T. affairs, including the Alumni Fund Campaign, and to various recent engineering works with which one or more members had become personally familiar. The meeting was voted interesting and a success. — RICHARD L. BERRY '30, *Secretary*, 2403 North Delaware Street, Indianapolis, Ind.

### *Technology Club of Southern California*

On December 14, 26 Alumni sat down to an enjoyable meal at the University Club, which was followed by a meeting presided over by William H. Robinson, Jr., '24. After dinner each man announced himself, his Class at the Institute, and his business affiliation. It was interesting to note that practically every phase of California industry was represented, with the oil, motion picture, and aircraft industries leading the procession. Another group typical of Los Angeles, the builders and architects, was well represented.

Uncle Horace Ford, Treasurer of the Institute, was our guest of honor and principal speaker. Seldom has a more interesting and stimulating picture of Institute life been given our group here, and it was especially interesting to hear a talk from a nonacademic viewpoint, with emphasis on the financial and administrative features of the school. Mr. Ford drew some interesting comparisons between Tech today and yesterday, leaving the impression in everyone's mind that Tech may still be Hell but that it is no longer unmitigated Hell. An interesting group of slides were shown, illustrating the proposed new buildings, both academic and athletic. — RALPH B. ATKINSON '29, *Secretary*, 6706 Santa Monica Boulevard, Los Angeles, Calif.

### *M.I.T. Club of Northern New Jersey*

Wednesday, February 9, at the Newark Athletic Club is the date and place for the midseason smoker. Notices mailed to the faithful are calling attention to the lively program supervised by Cac Clarke '21 and personally directed by Clayt Grover '22 and his staff, which consists of R. S. Wetsten '21, R. Haskell '03, and E. E. Ferguson '30. They have scheduled entertainment, the festive bowl, food for the frame, and food for the mind. The quieter moments will be given over to the topic of employment and personnel problems under the egis of N. McL. Sage '13 from the well-known city on the Charles.

Interest appears to be feverish on the subject of the regional meeting, appealing particularly to brethren who detest a drive or ride into Newark proper. It happens that the Central Railroad of New Jersey has a habit of circumventing Newark, and as a number of members live in such places as Westfield, Cranford, and Plainfield, the logical attempt to take the temperature of the patients would be centered in Plainfield. It's bound to happen!

The agenda was a full one at Ev Vilett's ('22) last executive committee call in December. The list brought out protracted discussion on plans and policies which will be given the light of brief mention to all members at open-meeting time. Among the most important are ideas on more formal club organization, employment aid, scholarship, and alumni drive committee work.



Monthly luncheons at the Newark Athletic Club from twelve to two on the second Thursdays of the month are still going strong. — A. RAYMOND BROOKS '17, *Secretary*, Wayside, Brantwood, Summit, N. J. FREEMAN B. HUDSON '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N. J.

### *Technology Club of Philadelphia*

The Club met at the Hotel Sylvania for dinner on Friday evening, December 3. Francis B. Kittredge '21 spoke about the Alumni Fund Campaign for the Philadelphia district and Walter J. Beadle '17 did the same for the Wilmington section. The meeting was addressed by Leicester F. Hamilton '14, who spoke on the student activities, pranks, and troubles. About 50 members attended the dinner, and all enjoyed Professor Hamilton's talk. — PHILIP M. ALDEN '22, *Secretary*, 1000 Chestnut Street, Philadelphia, Pa. WILLIAM J. KELLY '09, *Review Secretary*, 6409 Woodcrest Avenue, Philadelphia, Pa.

### *M.I.T. Club of Western Maine*

Once more the Club blossoms forth into activity after an extended period during which no meetings have been held. A dinner at the Eastland Hotel, Portland, on November 3, was the occasion enabling 22 Tech men from Portland and other places in western Maine, notably Sanford and Augusta, to gather around the festive board. This meeting was in the nature of a home-coming, for our guests were Marshall B. Dalton '15, President of the Alumni Association, who is a native of Portland, and Ralph T. Jope '28, business manager of The Review, who likewise was graduated from the Portland High School. After the dinner, our President, Stanley W. Hyde '17, introduced S. Lindsay Lord '28, the director of the Portland Junior Technical College, an institution which opened its doors for the first time last September and which now has a faculty of about 10 and an enrollment of about 50. This school is already in the process of moving into larger quarters on Plum Street. Its aim is to offer courses comparable to the first two years of technical college, so that its graduates can enter other technical colleges as juniors, and it furthermore encourages its students to conduct some research work along lines which will prove beneficial to Maine industry.

Following Mr. Lord's talk, President Dalton was introduced. He outlined in a general way the \$12,500,000 program of expansion that has been adopted by the Institute, illustrating his talk by slides showing the new Architecture Building, the new wind tunnel, the high-voltage apparatus, and similar advances now being made. The portion of this expansion that has been assumed by the Alumni Association is \$1,650,000. This amount covers the cost of a new gymnasium and field house, as explained by Mr. Jope, who also used slides. Following this, President Dalton made a plea for funds

with which to complete this project. Lewis D. Nisbet '09 is the general chairman of a committee to canvass the Alumni in this district, and he has appointed men in each locality to assist him. It is the hope of President Hyde that every Alumnus of this district will be interviewed regarding this important undertaking. — ALFRED E. B. HALL '15, *Secretary*, 19 Locke Street, Saco, Maine.

### *M.I.T. Club of Toledo*

The Club met at the University Club on the evening of November 30 to hear a talk by B. Alden Thresher '20, Director of Admissions, on plans and projects at the Institute. Because of Professor Thresher's visit, we were fortunate in having with us the principals of five of the leading high schools of Toledo, and following the talk there was an interesting discussion regarding the admission requirements to the Institute and the part that the secondary schools could play in the present program.

The following Alumni were present: H. A. Barnby '23, W. F. Donovan, Jr., '24, A. Gardner '02, H. Grinsfelder '31, P. B. Hartman '31, H. F. Stose '21, R. W. Tracy '24, W. R. Vosper '26, R. C. Wellwood '33, and C. P. Whittier '27. — CHARLTON P. WHITTIER '27, *Secretary*, Owens-Illinois Glass Company, Toledo, Ohio.

### *Washington Society of the M.I.T.*

The regular monthly meeting of the Society was held at the Cosmos Club, Friday, December 17, at 12.30 P.M. After the luncheon a sound motion picture, "Development of Radio Communication in the United States Coast Guard Service," provided most interesting entertainment. Among the invited guests were J. D. Craik and George B. Gelly of the United States Coast Guard Service, and E. M. Webster, acting assistant chief engineer of the Federal Communications Commission. Harry W. Tyler '84 presided.

The list of members and guests present follows: Henry Randall '31, M. W. Powers '20, J. D. Craik, G. B. Gelly, E. M. Webster, H. W. Tyler '84, S. W. Jones '00, H. Butler, guest, M. L. Emerson '04, W. D. Rowe '24, J. P. Story '94, H. G. Hamlet '96, P. L. Dougherty '97, B. A. Howes '97, W. I. Swanton '93, W. H. Hubbard '00, A. W. Lyon, guest, G. E. Lamb '24, L. H. Tripp '06, A. E. Hanson '14, G. N. Wheat '04, E. F. Mashburn, guest, G. R. Hopkins '22, A. Addicks '21, C. P. Kerr '11, J. C. Dort '09, A. H. Ronka '23, H. Diamond '22, F. G. Kear '27, P. Blouke '19, E. J. Grayson '17, H. L. Jewett '33, D. P. Allen '11, G. D. Mock '28, F. W. Swanton '90, F. T. Schneider '92, A. M. Holcombe '04, C. Bittinger '01, F. E. Fowle '94, C. Greenough, guest, W. B. Poland '90, and Allen Pope '07. — HENRY D. RANDALL, JR., '31, *Secretary*, 119 South Chelsea Lane, Bethesda, Md. LAWRENCE W. CONANT '21, *Review Secretary*, 3008 Ordway Street, Northwest, Washington, D. C.

### *M.I.T. Women's Association*

On December 2 a few of the members enjoyed getting together for dinner at the English Tea Room on Boylston Street, Boston, and attending the Dramashop play, "Ten Nights in a Bar Room," held in the Commons Room at Rogers Building. We should attend more of the student plays — they really are fun. On December 8 at Ellen Richards Memorial tea, a business meeting was held to discuss past, present, and future plans. It was voted to look into the question of adequate physical training for the women students and to make recommendations. The Association as a group would like to contribute to the funds being raised for the proposed recreation building. — PHYLLIS NEEDHAM '36, *Secretary*, 85 Kemper Street, Wollaston, Mass.

## CLASS NOTES

### 1877

We present this month the final installment of Bacon's letter: "Now having begun, I may as well continue my personal story. I remained three years at Assos — 1881, 1882, and 1883 — spending winters in Munich, Rome, and Athens. Walker, my dear friend, was with me at Assos during the first season of 1881, and we afterwards had a gorgeous time together in Rome and were ever after closely attached down the years. (Farewell, Howdy, you left us last Easter!) I returned to America in 1883, finished my Assos drawings in 1884, and was then anxious to earn a living, as in the meantime I had become engaged to be married. Through Professor Norton I got a position with H. H. Richardson in Brookline. After a few months I saw the long road ahead before I could become financially independent in architecture, so having had a taste of furniture and interiors with Herter, I got an introduction to A. H. Davenport and entered his employ, abandoned architecture for the decorating and furniture business, until my retirement some eight years ago owing to uncertain health.

"I married the daughter of the British consul at Dardanelles, and this has caused me to wear a path across the ocean from Boston to this place, where I find myself now on my beam ends, legs rather shaky and hit by Ole Man Depression, but still fairly cheerful. I have had a heap to think of: was chased out of here in 1914, when the World War began; wife was taken to Constantinople, did not see her for five years; son in United States Army, sent to France, his wife and children my care, as well as the business. Then I was chased out of here again in 1922, when the Turks captured Smyrna; and now again this summer when they talked of 'fortifying the Straits,' great excitement here and it looked as though we might have to pack up again. But the visit of the English King helped calm things down. . . .

"For the last six or seven years I have been living in this Classic region, only an hour from ancient Troy by motorcar,

1877 Continued

making frequent visits to Athens, Constantinople, Smyrna, and so on. In 1931 I spent six weeks in that enchanted island, Rhodes. In all these places I drew, made photos and rubbings of Greek full-sized details in the various museums. I was hipped on the subject of *full-sized* moldings, especially early Greek ones. Most young draughtsmen have no idea of why they string moldings together. When you draw a full size of a good Greek original you shake hands with the man who made it. I scolded Stevens, an old McKim's man, who measured and drew the Erechtheum for publication but never a full size in it. *Half size* will not do; it is not the same thing.

"My brother Henry, architect of the Lincoln Memorial at Washington, when abroad on the Rotch Scholarship, made for his own use a complete set of all the full-sized moldings of the Erechtheum; he gave me a copy which it was always a joy to use. Henry was ten years younger than myself. I had superintended his early education, got him into McKim's where he made good, and I had hoped for his companionship in these later years. But he went out of the world before his time! In the publication, edited by me, of 'Investigations at Assos,' 1921, are many full-sized moldings which Gilbert and other architects often told me they had found helpful. I have many portfolios of full sizes and rubbings of Greek detail, which I intend to give to the library of the American School in Athens for future students to carry on. Greece is the best place for this, as Roman stuff is not in it.

"I spent a couple of weeks last July in Constantinople; saw St. Sophia again with Whittemore, who is doing the mosaics; read 'Villehardouin — Chronicle of the Fourth Crusade' when the Latins captured Constantinople in 1204 — great to read on the spot. And I went Byzantine for a week, visiting all the old palaces, but I do not care much for Byzantine. How we used to curse at Assos at finding a filthy Byzantine mortar wall all mixed up with a fine Greek building! But it is quite time to stop this long rigamarole. So, I will sign off here!" — BELVIN T. WILLISTON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

## 1881

Knowing that all classmates will be interested in a tribute to Edwin J. Lewis, who died on October 16, we reprint here the words of Adelbert L. Hudson in the *Christian Register* for November 18: "In the death of Edwin Lewis, Boston, Mass., has lost a man who combined in an unusual degree those qualities that develop sterling character, good citizenship, and religious loyalty. As an architect he has left behind him, in many beautiful homes and churches in New England and elsewhere, the evidence of his rare artistic judgment, taste, and sense of the fitness of things. At the same time he was building his own life into the life of the church, and of many other organizations tending to promote 'a finer public spirit and a better social order.'

"For a man of strong convictions, he was singularly free from personal prejudice. If he was convinced that anyone was working sincerely in an enterprise which promised good results, he was always ready to help, no matter how widely he might differ as to methods. With his fellow workers he was a very frank and thorough critic and often saved his friends from serious blunders by his thoughtful foresight. But in such criticisms there was never any hint of dogmatism or of patronizing superiority. His tender consideration for the feelings of others, and his delicate sense of humor, transformed any difference of opinion into a mere suggestion appealing to the other's judgment. . . .

"Although keenly conscious of the negative tendencies of the time, he never lost faith in the future. With mature and well-balanced judgment, he believed that religion, philanthropy and education were a sufficient safeguard against the dangers which threaten civilization; and he gave the best that was in him to their support, helping in many ways of which his friends in general never knew. To his own church he was quietly a tower of strength, with wise counsel, generous support and devoted loyalty. The last time he went to his office on Park Street, or left his own home, was to attend the meeting of a committee of the First Parish Church in Dorchester, of which he was chairman, thus giving his last strength to the church he loved.

"It is such men as he who leave to us who survive them a legacy of hope and courage, and a challenge to devote our lives, as he did, to help in promoting those influences which underlie all moral progress."

From the *Boston Post*, October 23, we quote the following: "Ultimate public bequests approximating \$150,000 were made in the will of Edwin J. Lewis of Milton, architect, who specialized in rural dwellings and churches, in his will filed yesterday afternoon in Dedham. After several personal bequests amounting to \$6,000, Mr. Lewis left \$1,000 to the 20th Century Club, \$1,000 to the Boston Society of Architects and \$1,000 to Milton Hospital. The rest of his estate was put in trust for his two sisters, Misses Bertha R. and Marion K. Lewis of 121 Canton Avenue, Milton.

"Upon the death of his sisters, the estate will be divided. To the Massachusetts Memorial Hospital will go \$50,000; to the American Unitarian Association of Massachusetts, \$60,000; to the First Parish Church of Dorchester, \$5,000 for the needy of the parish. What remains after these bequests is to be divided among the Museum of Fine Arts, the Boston Athenaeum, Massachusetts Institute of Technology and Tuskegee Normal and Industrial School in Alabama." — FRANK E. CAME, *Secretary*, Chambley, Canton, Quebec, Canada.

## 1887

Arthur Nickels, writing from his home in Bath, Maine, says: "I expect to leave here December 28 for Sarasota, Fla.,

stopping over one night with cousins in Brookline and one night in Washington. I often think of what a happy time we had in Marblehead last June. It makes us remember that we were once young."

Lonsdale Green, without whose loyal and unfailing support your Secretary would cease to function as a purveyor of matters of class interest, writes that at the present time, in addition to his labors as secretary of the Ohio Society of Chicago, he is busily engaged in soliciting contributions for the Alumni Fund as one of the 20 or more assistants to L. H. G. Bouscaren '04, the chairman of the committee in the Chicago area. As there are some 700 former Tech men in this territory, it is a fair assumption that much wampum will be gathered. Lonsdale recently contributed an article on "The Spirit of '76" in the *Buckeye Bulletin* of the Ohio Society of Chicago. The article was inspired by his visit to the home of the painting in Abbot Hall, Marblehead, during our memorable reunion in that historic old town last June. The subject is one of the most inspiring portrayals of patriotic spirit to be found anywhere in American history.

An interesting portion of Wilcox' letter describing his European trip of last summer was omitted from the December Review by reason of the limited space at that time. As the opportunity now presents itself, the Secretary herewith supplies the enforced deletion, with apologies to Wilcox for its previous omission. He writes: "One of the high spots of our trip was a trip to the top of Mount Vesuvius. There is now a good auto road most of the way, followed by a half-hour climb on foot over a good but steep trail, then a scramble over the rough lava, some of it still hot with occasional streaks of still molten and red-hot stuff. One of the guides detached some of this and imbedded some coins in it, making nice souvenirs on cooling.

"The Arab quarter of Algiers was very interesting, and certainly the dirtiest place visited. Lisbon and Punta Delgada (on San Miguel Island of the Azores group) also afforded several hours each of quite worth-while sight-seeing. In the latter place the transportation facilities especially interested me. Automobiles are common, but two-horse carriages are much used for sight-seeing, their slower progress being an advantage when used for this purpose. Much of the freight hauling, which in other places would be done by trucks, is here done with two-wheeled carts usually drawn by one ox, though horses and mules are also used. We saw a number of small carts drawn by sheep, and a few by goats." — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

## 1888

Charles A. Stone, chairman of the board, Stone and Webster, Inc., is acting, at the request of President Compton, on the general committee in connection with the Alumni Fund to increase the recreational facilities at the Institute. In a recent letter he states that he is also assist-



1888 Continued

ing in rounding up the members of our Class who are living in the vicinity of New York City, with the hope that we will be able to raise a substantial fund.

You have all received a letter signed by our special class fund committee — John Runkle, Fred Ellis, Sanford Thompson, and Fred Wood — and I know that you will agree with me that it is irresistible and leaves no avenue of escape, requiring a reply of some kind along four different lines as indicated. If you have not answered this letter yet, please do so for the benefit of future generations of students and the glory of the Class of '88.

The report of the 50th anniversary celebration of the Class of '87 last June states that only two went out for golf. While we admit that the Class of '87 was a very athletic Class, still we predict that '88 will have five times the above number playing golf next June, somewhere along the Massachusetts Coast. For a few we will mention: Moore, Ferguson, Horn, Thompson, Webster, Besler, Nichols, Fuller, Runkle, Ellis, Wood, and your Secretary. We know that we have offended many other golfers in the Class by omitting their names from the above list; if you will kindly advise your Secretary, he will gladly make a public apology.

The Boston *Evening Transcript* of November 15 has an article on the difference between the stretch-out system and scientific management as explained by our classmate, Sanford E. Thompson, who is recognized as one of the highest authorities on scientific management in the country. The article throws a new light on this subject, and if you have not read it, you will be repaid by doing so. — Joseph Cooke Smith, architect, has lived in Europe — mostly in France, Switzerland, and Germany — for the last 30 years, and your Secretary is sending him a special invitation to be present at our 50th next June and to tell us all about what he has been doing since he left the United States of America in 1908. Such a tale should be interesting, and we hope he comes.

The Virginia Electric and Power Company furnishes electric service to the territory between Washington, Richmond, and Norfolk, as well as a section of northeastern North Carolina. It has a 63,000-kilowatt steam plant at Richmond and a 74,000-kilowatt steam plant at Norfolk, as well as seven hydro plants to insure continuous current at all times. Our classmates, Stone and Webster, are owners and operators of this company. — Your Secretary is a hiker in a small way, when he is not playing golf, and if he is not overwhelmed with letters from classmates during the coming month (which he hopes he will be), he will tell you in our next issue some of the things he saw during a 13-mile hike around Norfolk through some of its industrial suburbs. — BERTRAND R. T. COLLINS, Secretary, 407 Warren Crescent, Norfolk, Va.

## 1889

The Class has had a staggering blow in the loss, within a few days of each other, of its President and its Treasurer; the

Secretary's sense of personal loss is so great in each case that he finds it difficult to comment upon or even mention the matter. Both Will Thurber and Harry Hunt were men of the very highest type that can be produced and their worth showed itself in a thousand ways. The following are highly inadequate newspaper accounts of their two lives. The first comes from Milton, dated November 12: "William B. Thurber, Hinckley Road, vice president of the Blue Hill Bank and Trust Company, and one of Milton's most prominent and best-loved citizens, died suddenly at his home yesterday noon. . . . Born and receiving his early education in Plymouth, Mr. Thurber later attended and graduated from Massachusetts Institute of Technology. He entered the employ of the New England Telephone and Telegraph Company and after a few years went to the Baker Chocolate Company at Milton, where, after serving as superintendent for 14 years and vice president for six years, he became president, retiring a few years ago, after having been connected with that company for 35 years. For six years he was chairman of the Milton School Board, he was a Selectman, a trustee and treasurer of Milton Academy, chairman of the Lancaster and Shirley Industrial Schools committee, treasurer of M.I.T., of Simmons College, a trustee of the Milton Savings Bank and filled many other offices of trust and honor in civic and humanitarian organizations. Mr. Thurber is survived by his wife, Mrs. Julia D. Thurber; three sons, James Perry of Milton, William Schuyler of Chicago, Richard Bowen of Charlotte, Vt.; and a sister, Miss Elizabeth Thurber of Milton; and two grandchildren."

December 1: "Harry Hampton Hunt, 69, nationally known electrical engineer and vice-president of Stone and Webster, died suddenly yesterday while on his way to his home at 68 Prospect Street, Melrose. Born in Melrose, son of Harvey and May Covel Hunt, he was graduated from the Massachusetts Institute of Technology in 1889. He became associated with Stone and Webster in 1900 and was admitted as a member and vice-president in 1920. He was chairman of the board of the Stone and Webster Service Corporation, and director of the Stone and Webster Engineering Company, the Stone and Webster Realty Corporation, the Tarrant County Traction Company, the Florida Assets Corporation, the Galveston Electric Company, the Galveston-Houston Securities Corporation, the Houston Electric Company, the Jacksonville Traction Company and the Northern Texas Electric Company. He was a member of the American Electric Railway Association, the National Electric Light Association, the Massachusetts Charitable Mechanics Association, the Massachusetts Horticultural Society, the Bostonian Society and the Boston Chamber of Commerce. Mr. Hunt was a noted yachtsman. He was a member of the executive committee of the South Massachusetts Yacht Racing Association, and a member of the North American Yacht Racing Union, the Bos-

ton Yacht Club and the Duxbury Yacht Club. He was also a member of the Union Club, the Exchange Club, the University Club, the Massachusetts Automobile Club and the Morgan Horse Club of New York. . . ."

If any dear reader wishes to spend a delightful half-hour in his armchair, the Secretary recommends that he obtain a copy of "Metallurgical Reminiscences" by Albert Sauveur, which is an account of Sauveur's early professional life written by himself. It would be impossible to reproduce in a review the whimsical humor and gentle irony of Sauveur's mellow reflections. Perhaps it is enough to say that very few professional writers attain the light touch of the "Dean of American Metallurgists." A preface by H. M. Boylston sums up the author's career and his many degrees and decorations both at home and abroad and concludes with the words: "Dr. Sauveur is a great teacher, a great scientist and a great man." The brochure is published by the American Institute of Mining and Metallurgical Engineers, 29 West 39th Street, New York City.

The Secretary has received the news of the death of Nathaniel Brewer on August 14, but has no particulars.

On account of the loss by death of the President and the Treasurer, the Secretary, as the only surviving officer, has asked E. V. French to take over the job of treasurership until he can be legally elected at the next meeting of the Class, and this he has kindly agreed to do. The Secretary would appoint a nominating committee to bring in nominations for the office of president. — WALTER H. KILHAM, Secretary, 126 Newbury Street, Boston, Mass.

## 1891

We only recently received notice of the death of Stephen L. Coles, who lived at Kew Gardens, L. I. He died on May 7. Our records mention his writings, which included "The Story of Electricity," written with T. C. Martin. He was at one time radio editor of the New York *Herald Tribune*. Married but had no children. — We are hard at work, checking up subscriptions for the Alumni Fund Drive. If we have not heard from you and you have not subscribed, we hope you can send in a subscription shortly.

Howard and Mrs. Forbes got back from their trip to the Coast during the latter part of October. All we know so far is contained in a letter from Mrs. Forbes written from Prescott, Ariz., and Hot Springs, Ark.: "We left California, October 10, and are now on our way home. The 'Boys of '91' have made them living cities for us — Santa Barbara with the Garrisons, San Diego with the Alleys, and Pasadena with the Hoopers. They made us acquainted with their cities and showed and explained things we should never have got otherwise.

"While we all studied geography once, there is nothing like seeing things with your own eyes. Of course we only saw from the windows of our car one road across the country, and we shall see an-

1891 Continued

other one road back, but I never knew before that pretty nearly the whole center of the country you would hate to live in. There are deserts, mountains, and plains that you do not like to think about. It consoles me to know that less than one hundred thousand people live in the state of Wyoming and only about the same number in Nevada. The salt deserts of Utah are perfectly horrible, miles of glistening white salt-filled sand and blistering hot for months. The other deserts are bad enough, but this is terrifying. Then suddenly from the desolations of these bad states you go over mountains into California, and the wealth and beauty there seems unfair. Of course, without water even California would be rather a desert, but with water, which fortunately they have most everywhere, the place is paradise. Such trees, such flowers, such fruits! A coast line and climate which rival if not surpass the French Riviera, and mountains behind of every shape and color.

"If you must have deserts, those of Arizona are far and away the most inviting. They are rather rolling; there are always blue mountains in the distance; and growing on them are most astonishing cacti (astonishing at least to a Yankee), strange shapes and, when in bloom, lovely colors. There are, besides, trees of sorts, prickly and twisted, but from a distance they look as if they would give an inch or two of shade from the hot sun. After Arizona we went for miles through more country that looked good for little or nothing — flat, sandy, and practically treeless — not absolutely a desert, as roaming cattle find something to eat. We are now in Arkansas where there are honest-to-goodness trees, grass, and water, and I am hoping from now on to be in a country fit to live in." — We know they reached home safely and expect to see them a few days after these notes are sent in.

A postal from Bert Kimball mentions his enjoyment of his trip East and especially his pleasure in calling on Barney. — While we hear frequently from Charlie Garrison, we have not quoted much from his letters, not because they lacked interest but because our space is limited. His letter of October 27 tells of some recent trips and is unusually interesting: "We enjoyed seeing Howard and Edith Forbes for the few days they allotted to Santa Barbara. Monday we dined with Bert Kimball, who was visiting his sister, Evelyn Richmond. So we get these fleeting views of the classmates who mean so much to us.

"Margie and I celebrated our 42d anniversary (a little belated) by taking a couple of weeks for a tour. We left Santa Barbara, October 8 at 7.06 A.M., on our way to Boulder Dam. As we passed through Santa Paula, the mountain back of the town was aflame, with a heavy pall of smoke drifting seaward. At one point the fire was very near to some derricks in the oil field. After 150 miles we came to Mojave on the edge of the desert. The road follows the contour of the land with dips and rises and is like going up and

down in a swing. We covered the 68 miles to Barstow in 79 minutes. Here we had an early lunch and left at 12.15 on the good old highway 91. To Las Vegas, Nev., where we spent the night, was 155 miles of desert and mountain (4,800 feet) which we covered in two hours, 53 minutes. Saturday, October 9, we left betimes for the Dam, 6.25 A.M. We passed through Boulder City — very pretty and well laid out in the desert, some eight miles from the Dam. We walked over the great structure and were much impressed by its fine surroundings — the mountains and the great lake, 110 miles long, only a small portion of which could be seen. We left the investigation of the power plant until another time and returned to Las Vegas, where we again joined highway 91 at 8.45 and sped on to Zion Park, 181 miles, which we reached at 1.03. After exploring the park we went through the mountain tunnel, more than a mile long, with windows cut out at several places to see the valley below, and came to Kanab [Utah], 44 miles beyond the park. Here we spent a very comfortable night.

"Sunday, October 10. We left Kanab at 6.05 A.M. for Bryce Canyon, 95 miles north. The day was showery, but when we reached the park the sun stayed out all the time we were viewing the colorful forms of the rock formation. Curtains of rain were falling at many points of the horizon. At Rainbow Point we were at an altitude of 9,105 feet. When we left the park we ran through several showers, but it cleared as we reached Kanab, where we had lunch. From there we drove to the north rim of the Grand Canyon — where we viewed the wonderful scene from two points of vantage. We spent the night at Kaibab Lodge, some 20 miles from the rim. It was dusk as we came to the camp, and we saw more than 100 deer grazing in the fields by the roadside, some so tame they stood near the car as we passed.

"Monday, October 11. When I looked at the car in the morning the thermometer inside was 22 degrees and the windows covered with a heavy frost. Fortunately nothing froze and the car started at once. We left at 6.14 for the south rim of the Grand Canyon. We descended into the canyon valley gradually at first, then down a steep grade. After 68 miles we crossed the Colorado River at Marble Canyon. Then for 70 miles we went over rough, dusty roads like those of ten years ago. We started out of the valley at Cameron and from there on had perfect roads. Although I have written about crossing the 'valley,' the altitude was from 3,800 to 5,900 feet. The road now ran toward the south rim and the latter part of the 60 miles had many scenic points of view where we stopped and looked across to the land from whence we had come. We arrived at noon, having traversed 197 miles.

"In the National Parks they have accommodations for the wealthy — \$12 a day — and for the campers; but for Mr. Average Man the lodgings and food are poor and expensive. The Grand Canyon is now a shining exception. The old cab-

ins without running water have been replaced with modern ones with comfortable beds, the best plumbing, with tubs in many of them, steam heat in each room, furnishings attractive, heavy towels and plenty of them. Price for two people, \$4.50. The old cafeteria has been replaced by a modern coffee shop with reasonable prices for good and well-cooked food. What a contrast to the Yosemite, for instance! We saw the wonderful views, visited the Indian shops, watched the Indian dance. We spent the next morning until noon walking along the rim.

"Tuesday, October 12. We left at 10.50 for Prescott, where we wished to call on a friend made on our Alaskan trip. When we reached there we found that she was away, so we kept on to Phoenix, where we found a new camp on the west side of the city. We covered the 243 miles in six hours of driving. Wednesday, October 13. Left Phoenix 5.22. Stopped at Gila Bend and El Centro for food, crossed the mountains at 4,100 feet into San Diego and then to La Jolla where we arrived at 1.49, having gone 381 miles. Ninety degrees was the highest temperature, not uncomfortable. We went over long desert roads, finely paved. At Yuma the road crosses the sand dunes ever shifting, blowing across the road. We saw the remains of an old corduroy road the early pioneers had made to cross this treacherous stretch. At La Jolla we took a cottage for a week, with the ocean just across the road. Heavy rollers hit the rocky coast, sending the spray high in the air. You could sit on the benches and watch it for hours with untiring interest. If you look on the map you will see that there is open water between that part of the coast and Shanghai — perhaps that accounted for the heavy seas. We enjoyed seeing Arthur Alley and his sister at National City. Twice we lunched with friends at Balboa Park. One day we spent with relatives in El Cajon — so that we had a busy week. Once we lunched at Del Mar, a few miles up the coast.

"October 20. We left before 8.00 and drove up the coast in a fog. We came to San Marino to spend the night at Bob's. They had just returned from a restful trip to the Canal Zone and back. The grandchildren were well and Anne is nearly normal and can do anything in reason. The next day we returned to Santa Barbara over the Santa Susanna Pass where the temperature was only ninety-eight degrees, but on coming near the ocean it dropped to 70 degrees. Saturday we go to San Marino for the week-end and Bob and Cath are going to the Yosemite. Last Tuesday we had our music club here and are now settling down to the fall and winter routine. We have done pretty well this year: Redwood Highway, Victoria, Vancouver, Alaska, Yosemite, Boulder Dam, Zion Park, Bryce Canyon, North Rim Grand Canyon, South Rim Grand Canyon, La Jolla, and some ten thousand miles of auto travel."

A letter from Ernest Hersam to George Hooper written November 29: "I have your letter of the 17th instant and, as always, am happy to have a recent word



1891 Continued

from your household and from you. As distances expand and time shortens with advancing years, letters become indispensable to maintain the solidarity that the matrix of Tech demands and that good-fellowship in the shadow of New England should bring to us. . . .

"We were sorry to miss you in your passage through this north country in the summer. But Mrs. Hersam and I must plead guilty to a lapse of amenities, for we were in the South for a month or so in the autumn trying climatic and allergic change between seacoast and Palm Springs and Death Valley, and even at your own Hotel Green for two days, in transit along one diagonal or another across the southland. Mrs. Hersam has been in extremely poor health during the past year, and we are doing all we can to keep body and mind up to the requirements of a comfortable life. I am withdrawing little by little from all the activities of my college duties. I think we both are in better shape upon our return than we were when we launched out on this carefree exploration into parts of the State that we had not known so well. I was happy to have a few minutes chat with Swan the day he was stopping here at Berkeley with Austin Sperry, his old Tech roommate. I wish the contact might have been much more intimately extended."

Walter Hopton writes of visiting his son in New Jersey. His grandson was born last April and was named Lester Charles Hopton, Jr., thereby carrying along another generation the names of his closest friends in the Class of '91—Lester French and Charles Aiken. Incidentally, these three, as well as your Secretary, were among the founders of Phi Beta Epsilon Fraternity which is now so firmly established at Tech and has some 350 alumni. Walter says he did not go to Webster Lake last summer.

We did not have space in our last notes to cover an interesting letter from George Hooper, telling of his summer trip up the Redwood Highway: "From Carmel on, on the mountain trip, we followed new roads, both for the scenic beauty and also to avoid going through San Francisco in order to reach the Golden Gate Bridge. As road maps are printed in two dimensions only, we were not prepared for the twists, turns, and climbs involved in following the old shore road from Santa Cruz to San Francisco, and we climbed every mountain ridge in that part of the peninsular and negotiated more curves and angles in all planes than Faunce and Johnny Runkle ever showed us in their several subdivisions of geometry. It is quite an experience to wind up a mountain on a one-way road, into a solid bank of fog, with no notion of what may be coming down in the shape of trucks and cars with trailers. Fortunately, on account of its difficulties, that road is but little used and we had the good fortune to meet oncoming traffic at points where passage was possible. The maps show an excellent highway along the coast but this is not yet finished. It will be a very beautiful drive when ready for use.

"On reaching San Francisco, a great deal of difficulty was experienced in finding the entrance to the Golden Gate Bridge, our trail leading us twice under the approach and then for several blocks directly alongside this but in the contrary direction to bridge traffic. However, we finally found ourselves at the right place, after passing through several beautiful parks, a new and very fine residence district overlooking the Golden Gate, and through the United States military reservation, the 'Presidio.' This, with the various coast artillery defenses and the bombing base over in Marin County, makes San Francisco a very formidable military center.

"It is quite a thrill to pass over the bridge and avoid the slow, shut-in, and expensive ferry trip, but aside from this there is little of interest, as the side railings are so heavy and high that nothing can be seen of either side from a car. Stopping and turning on the bridge are not permitted, and drivers are urged to maintain the legal speed of 45 miles per hour, so that but a few minutes are available for observation purposes. It has become quite a 'stunt,' however, for pedestrians to pass over the bridge and back, for their afternoon exercise, and there are many such on the sidewalks.

"After leaving the bridge, we wound over more ridges by the Muir Woods and Mount Tamalpais, to finally reach Inverness. The recent discovery near there of the brass plate erected in 1579, on a post, by Sir Francis Drake, marking his visit there and his assertion of possession of the land for England, interested me very much and I looked up the circumstances, which were unusual and somewhat amusing. The existence of such a plate was known from the records made by Drake and others, but it remained hidden until about two years ago when it showed up about 40 miles away from its supposed location. It appeared that a man from San Francisco went hunting near Drakes Bay and instructed his chauffeur to meet him. The latter, while waiting, strolled around in the bushes and kicked up this old discolored piece of brass and put it in a pocket in the car door. The lettering was so full of dirt and so corroded as to be nearly indecipherable. He, being an Italian-American, naturally knew little about the matter. Almost a month later, having forgotten the incident, he felt the plate in the car pocket and, deciding that it was useless, threw it out in the woods where it was later found. The California Historical Society has satisfied itself of the authenticity of the plate and paid the second finder a reward of \$3,000. One point on which I was unable to get any information is why England did not press nor make good the claim thus established to territory on this coast. Sometime I may run across these data.

"Inverness, as I wrote you last year, is a quiet little place, and this was accentuated this year by the presence of a family of mule deer, wandering around the roads near the little inn at which we stay. There were a buck, doe, and two half-grown fawns, all so tame that one could get

within 50 feet or so of them before they would move slowly away. The natives and summer cottagers did not enjoy greatly this bit of wild life, as vegetable and bulb gardens suffered severely. From Inverness we motored north up the Redwood Highway as far as Arcata, stopping en route at Benbow [Mo.] and Eureka. We had thought of going on to try salmon fishing in the Klamath River and thence to Crater Lake, but friends whom we met advised that there were more fishermen than fish at the former place and that they themselves had left Crater Lake during a snowstorm but three days previously, so that we turned back to Benbow and spent several days there. I described this in writing you last year. The Eel River there is similar to the Charles at Dedham or Waltham and we indulged in some boating for the sake of old times.

"After this we drove slowly back to Carmel, remaining there a few days to enjoy the beauties of that coast. In that latitude the afternoon autumn sun is so low, that all of the headlands and canyons are very sharply marked and the colors reflected from sky and sea are very brilliant. Then we motored slowly to Pasadena." — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R. I. BARNARD CAPEN, *Assistant Secretary*, The Early Convalescent Home, Cohasset, Mass.

## 1896

Just as the Secretary was about to dictate these notes on Thursday afternoon, December 23, Minor S. Jameson appeared in his office and reported that he was in Cambridge to spend Christmas with his daughter, whose husband is connected with Harvard. Jameson was looking very well but says that he has to watch himself. He still follows his hobby of painting, and his work is frequently shown in various private exhibitions in Washington. His call was all too short for the Secretary to have a real visit with him. Various classmates were mentioned, and among them Con Young. The Secretary has failed to receive this year the usual fall letter from Con telling of his annual southward migration from Cape Cod to Florida, and Jameson said that he had not heard of Con and Abby passing through Washington. Con is due to make a report of his summer and his Florida trip.

Another recent visitor in Boston from Washington was George Stratton, who is with the United States Bureau of Air Commerce. He had been on a business trip to Maine, and in the few minutes between trains in Boston he telephoned to the Secretary. It was fine to hear his voice, even though it would have been more pleasant if he had had time to make a personal call.

The Class seems to be getting its stride toward doing its bit in the Alumni Fund Campaign. One feature very pleasing to the Secretary is the personal correspondence involved with some men who are heard from very infrequently. All the Alumni were sent a progress report in December, giving the names of the mem-

## 1896 Continued

bers of individual Classes who had been heard from. Names are constantly being added to the '96 list, and the objective seems to strike a responsive chord. The classmates appreciate the poor facilities that existed in our student days and the great advantages that the proposed new facilities will have for developing better trained graduates.

Norman Rutherford writes that his health continues good, and he has many things for which he is thankful. Chenery, who is librarian at the University of Washington in St. Louis, is due to retire next June, and he plans to move to California. Irv Merrell apparently keeps busy in his retirement at St. Petersburg, Fla. He had had a letter from Lou Marble, in which Marble said that he was in very poor health and hardly able to get around the house. William Harrison Thomas, Jr., has become lost. He was in New Jersey with a chemical concern for many years, and then about a year ago he went with the Wareham Country Day School in Windsor Locks, Conn. This school is now reported to be closed and the Secretary is unable to find out where Thomas has gone. Billy Anderson has reported a new address for Charlie Howe at P. O. Box 322, Springfield, Ohio. Mrs. Lonngren has given the date of her husband's death as November 5.

Harry Baldwin is in charge of organizing the Alumni Campaign for his home town of Swampscott, Mass. He also has sent the Secretary a copy of the resolutions which he framed for the late Professor Elihu Thomson on the occasion of the Swampscott Town Meeting last April. As a member of the board of selectmen of Swampscott in past years, he had had many contacts with Professor Thomson, and it was most fitting that he prepare the resolutions. He did a splendid job.

Jacobs wrote from Burlington, Vt., a week before Christmas that they already had plenty of snow, and winter had started in good earnest. He and Mrs. Jacobs were planning a Christmas in Albany, and thence on to Washington, D. C., for the meetings of the Geological Society of America and a good time. His idle moments this winter are taken up with his seismograph and in preparing his next annual report as state geologist. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1899

Arthur Foote, writing from Grass Valley, Calif., claims that he is too far off the beaten track to collect much news, and he seems to figure that nothing that happens to him is news. He says gold mining is supposed to be booming because of the increase in price from \$20.67 to \$35 per ounce, and mines that could not pay a profit at the old price are expected to make a big one now. These expectations are far from being realized because mining costs have increased nearly as much as the increase in price. Wages are up, and the tax on undivided profits

bears heavily on those mines that operated for years at a loss. No account is taken of the loss and no allowance made when it comes to taxing. The three largest producers of gold in California are located in the Grass Valley district, and that county produces nearly three times as much gold as any other county in the state. — HAROLD SMITHWICK, writing from Southport, Maine, tells of a carefree existence and two years of liberty, during which time he has summered in Maine and wintered in the lands of the sun. Last year he went to Mexico City, and this year started off again, about New Year's, for a southern destination.

Bassett Jones attempted to retire about four years ago and finds himself immersed in the biggest job he has ever undertaken. In addition, he is writing a book, "Numbers Called Money," besides running the Nantucket Nurseries. His biggest job is serving as consultant to the board of design for the New York World's Fair in 1939. The job did not sound overwhelming when Jones was asked to sit in as a consultant, but he's getting in deeper and deeper, and is now over his neck, trying to keep his nose above water. He has recently returned from Europe after a technical study of the Paris Fair and the one at Düsseldorf. In between times he supervises the Nantucket Nurseries, where he has been experimenting in coastal planting and attempting to develop hardy strains of less hardy trees indigenous to coasts all over the world. He has succeeded in developing the black Japanese pine, Nantucket strain, that has been grown successfully from Gloucester to Westchester and Long Island, when planted so close to salt water and surf that it gets thoroughly soaked at times. The problem was to develop a strain that would stand snow and ice and hard winters. Jones has succeeded in this, and the Nantucket Nurseries is a going concern and in the black. They handle, select, root-prune, and care for a new crop of 20,000 "babies" a year.

As for the book, "Numbers Called Money," he began it about five years ago. He is examining the whole literature, and analyzing the whole theory and practice of index numbers, called by the great Swedish mathematician, Ivar Fredholm, "hermaphrodite arithmetic monsters, devoid of scuse." Arne Fisher, an internationally known mathematician and a statistician of world-wide repute, has guided him through that foggy sea of symbols called the theory of statistics. There was a good deal more in Jones's letter about his book, but if I were to tell it, you might not read the book. This is sufficient to stimulate interest.

W. E. Parker, writing from Fort Lauderdale, Fla., echoes Arthur Foote's plaint concerning scarcity of news. Then he proceeds to give me bits, such as his election to the position of adjutant of the local post of the American Legion. Also, they have organized a Tech club and it gives promise of becoming a live organization. Its territory extends from Palm Beach to the tip of Florida, and it is called the Technology Club of South

## THE TECHNOLOGY REVIEW

Florida. About 40 Alumni reside in that area and each takes enough interest to explain the cause of absence when unable to attend the meetings. — W. MALCOLM CORSE, *Secretary*, 1901 Wyoming Avenue, Northwest, Washington, D. C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

## 1900

Miss Mary Cutting, member of the senior class of Weston High School and daughter of Mr. and Mrs. George W. Cutting, Jr., was awarded the Golden Eaglet, highest Girl Scout honor, last November. — In the Springfield *Republican* of October 28, in an article reporting the annual meeting of the Massachusetts Baptist Convention, it was noted that James A. Patch was elected president. — Recently we received word of two of the members whose names were on the unknown address list: Herman R. Hunt from Hyattsville, Md., and Samuel P. Heitshu of Lancaster, Pa.

A long letter from Hal Jouett, just received, informs us of the sudden death of Jeannette Kelley Tuck, wife of Theodore C. Tuck, in New York, December 8. — Word has been received from Mrs. Fraser of the death of James M. Fraser, IV, on May 4 at Cleveland, Ohio. — We are advised by the registry of the death of Walter L. Weeden, II, of Bronxville, N. Y., on August 16, 1936. — Ann Hunter Sperry, wife of Marcy L. Sperry of Washington, D. C., died in New York on Saturday, December 11, and the interment was at Milton Cemetery. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

## 1901

The temporary illness of your Secretary in November interfered with the preparation of the class notes for the January Review and so deferred the inclusion of several very interesting items of class news, it being a fact that a number of 1901 men have been making real news and in some instances have been prominently referred to in the newspapers of the country. In fact, the address which was made by Lammot du Pont before the National Association of Manufacturers during the early part of November probably appeared in the newspapers of every country in the world. That address was most interesting and is well worth rereading at this time. Lammot also has been making other public talks and broadcasts since those to which reference was made in the November Review, and while it is not feasible to quote any of these talks at length in these notes, some of his comments relative to his own particular business are most worth while. We quote as follows: "Modern chemistry is a science dedicated to change for the better. The research chemist strives to improve existing products, create new ones, and reduce the cost of both. Place goods within the means of more people and you distribute wealth, give added value to money. Rising wage scales mean nothing if prices advance just as fast. But maintain fair wages and reduced prices and actually you



## 1901 Continued

put more in the pockets of the working man." That touches upon the secret of real progress and probably every industry in this country can make progress along similar lines if given proper encouragement and not uneconomically restricted.

We have further news regarding Fred Clapp, who is probably the most traveled member of our Class. Our last reference to him was made in the December Review. We now learn that the concessions and extensive explorations of Inland Exploration Company and Amiranian Oil Company in which Fred is so largely interested extend all the way from central Iran to the northern edge of India, a distance of 1,400 miles, and from the Caspian Sea and Oxus River on the north nearly to the Arabian Sea, or about 800 miles. Clapp has already made his fifth journey in five years to Meched, whence the geologists of Amiranian have spread out in all directions, inspecting numerous domes and anticlines. A few weeks ago he left for Herat, Mazar-i-Sharif, and Kabul on the Afghanistan side and was to be back in Seistan (southeast Iran) by the first of the year. About 3,000 miles per month must be traveled by car and animals across mountains and plains in inspecting the operations of these oil companies. Fred has been fortunate in meeting the right people, and it is apparently quite evident that those people have also been fortunate in meeting Fred.

Others of our Class have also been doing some traveling, Edward P. Beckwith having made a trip last summer to northern Arizona in connection with the Rainbow Bridge-Monument Valley and the Peabody Museum archeological expeditions. Beckwith made only brief reference to this on his last class data sheet but did mention that the expedition did a lot of aerial photography and other reconnaissance work. We wish that he had given a further description, as it must have been intensely interesting.

Charles Bittinger, as a member of the National Geographic Society, also has been doing some traveling in connection with the United States Navy Eclipse Expedition to Canton Island, 3° S. 171° W. Charlie wrote that he secured some motion pictures in Kodachrome which he believes are the first motion pictures in color ever taken of an eclipse. He wrote that he expected to show these pictures at the Washington Society of the M.I.T. Next summer if I happen to be traveling anywhere near Duxbury, Mass., where Charlie's summer home is located, I certainly will avail myself of his invitation to be given a private exhibition of these pictures. Other members of the Class must have been taking interesting trips and we hope to hear about them, as they make excellent items for these notes.

We are now very sorry to have to report the death of another member of the Class, C. Franklin Willard, who started on his last great adventure at Groton, Conn., on October 2. Willard received his degree in mechanical engineering with our Class and a degree in naval architecture with the Class of '02. He then taught for a short time at M.I.T. and in 1903 entered

the law school of Boston University, from which he received both bachelor's and master's degrees in law in 1907. In 1909 he entered George Washington University and in 1910 received the degree of master of patent laws. Following that he was connected for several years with the Victor Talking Machine Company at Camden, N.J., as an attorney, after which he was an attorney for a time with the National Cash Register Company at Dayton, Ohio, and finally went to Groton, Conn., where he established a law office and took an active interest in the affairs of that town. He was a member of the bars in Massachusetts, New Jersey, and Connecticut and was authorized to present cases in the Supreme Court of the United States and the first and third Federal district courts. For a time he was deputy judge of the Groton town court. All of this work since he left Tech was not much connected with the Course of Naval Architecture; however, he always kept his interest in that and during the last year or two actually took up some work in the fitting shop of the Electric Boat Company of Groton. From what he told me when I saw him last spring, he apparently secured a great deal of pleasure in returning to work connected with the course which he enjoyed so much at Tech. Willard leaves a widow, a daughter who is a student at Wellesley College, and a son who is connected with James Bliss and Company, Inc., 220 State Street, Boston.

Last fall your Secretary had a good visit here in Hartford with Mortimer Foster, whose business address is 347 Madison Avenue, New York City, but who has a summer place at West Hartford, Conn. (about 25 miles from Hartford). Mortimer stated that for some time his own business, which for years has largely consisted in the reorganization, merging, and building up of various concerns, has been rather slow, and I judge that he would be glad to hear of and could most capably take charge of any such management and reorganization work in which any of our classmates or their connections may be interested. From what he told me, I judge that he would be glad to handle such work in any part of the country but would be especially interested in looking after such matters in Connecticut or in New York State.

During the week of December 12 your Secretary was visiting in Boston and had the pleasure of having luncheon at the Boston City Club with several of the members of our Class's Boston committee for the Alumni Fund. There were present Ted Taft of M.I.T., Bob Williams (former Class Secretary), Ed Seaver, Ed Brigham, and the writer. Ted was our gracious host, and we had a most delightful conference and discussed ways and means of arousing further interest in the building up of the Alumni Fund for the improvement of the athletic and recreational facilities at the Institute. We are, therefore, hopeful that although the response from the Class has not as yet gone into high gear, many further replies will be received before the campaign is

finally closed, which we understand will not be before the first of April. Incidentally, Ted Taft stated that he was finding plenty to do in the Mechanical Engineering Department but in order to be sure that he was busy enough, he had recently taken on the chairmanship of the educational committee of the Plant Engineers Club, which is a Boston engineering society. Ed Seaver stated that his own business relating to condensers and other heavy machinery for the Foster-Wheeler Corporation, of which he is New England manager, was rather good and that future prospects appeared encouraging. Recently Ed had some rather serious stomach trouble but is now much better, and although when he sent in his class data sheet early last October he stated that he was "beginning to feel his age," I am sure that he is again ready to keep up with or even to lead the procession just as actively as ever. Bob Williams, who is still with the Submarine Signal Company of Boston, said he had no special news of his own affairs but that the Signal Company was reasonably busy and that he was hopeful for the future. Ed Brigham, whose present address is 142 Clinton Road, Brookline, Mass., is another one of the fortunate retired members of the Class but apparently finds plenty of interest to keep him profitably out of trouble. We now have quite a number of classmates who have retired from active business, and it would appear that some one of these days they will be interested to agree on some central point (for example, in Florida or out in Southern California) where they can organize an association of their own and perfect interesting initiation ceremonies for welcoming new members. — ROGER W. WIGHT, *Secretary*, Care of The Travelers Fire Insurance Company, Hartford, Conn. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

## 1902

Everett, who holds a professorship in the department of mechanical engineering at Penn State, is on sabbatical leave. — Ralph Kimball is no longer in Harrisburg, Pa., with the State Bureau of Standards, but in Tiffin, Ohio. — Class notes are scarce, as all members are too modest or too busy to send them in to the Secretary. As notes must go to The Review on the 25th of the month, two months before the issue, they can't be sent too early, or too often. News can't be synthesized even in a chemical laboratory. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

## 1903

Your Secretaries have recently been asked about the present location of Adolph E. Place, a member of this Class in the Civil Engineering Course. We were unable to supply it. He is one of a list of 46 men of '03 whose addresses are missing in the Register of Former Students. For some time it has been a matter of concern to us that so many have apparently deliberately lost themselves or been so out of touch with the Class that they

1903 Continued

have lost all desire to be remembered. It is possible that many have died without any member of the Class knowing it. In case information can be given by some of you who read these notes, we are listing the names of those in Courses I and II. If you know where they are, please let us know: A. S. Leavitt, A. E. Place, W. F. Tanner, and R. W. Tucker, all in Course I; K. D. Jewett, D. G. Leary, J. E. Reid, E. C. Thompson, and Frank Toohey, all in Course II. Later we may give those registered in the next Courses.

At present we are in the midst of a financial campaign. To December 14, when these notes were written, 20 members of the Class had pledged \$1,665 towards the Alumni Fund — not a very good showing. We hope by the time these notes are read, many more of you will have sent in your pledges. Meanwhile we are asking keymen in various parts of the country to see personally other '03 men in their vicinity. We ask you to give them a hearing and make as generous a pledge as you can. We are realizing that many '03 men form interests in other educational institutions through their children. Some time ago we listed 18 men who had a total of 44 children in 25 different colleges — only one in M.I.T. The rest were scattered all the way from Bowdoin, Bates, and Colby in Maine to Stanford in California and the University of Arizona. And, by the way, there are at least four grandchildren of the Class. So even if your interest is now in Cornell, Purdue, Vassar, or Alabama, remember the days we spent and the knowledge we stored and the contacts we made between 1899 and 1903, and send in your bit for a better Tech for the children and grandchildren coming along.

As you have probably gathered, if you have read this far, there was no news to record. Bear this in mind, too, and write your Secretaries something of interest before you forget it. We can't have '03 represented in these columns, if you don't help us out with items. We haven't the ability to write a whole column of real entertainment as Allan Winter Rowe, late Secretary of '01, used to do. We have to depend on what news gets to us from you. There must be plenty of things happening to you that would be of interest to the rest of us. — FREDERIC A. EUSTIS, Secretary, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, Assistant Secretary, 441 Stuart Street, Boston, Mass.

## 1905

International affairs being so much in the limelight, a letter from Jack Flynn, II, from Buenos Aires, Argentina, is particularly interesting. Jack, after confessing a feeling of guilt at neglecting his Class Secretary, explains as follows: "Believe it or not, we Yanks down here work harder than ever any of us has ever worked at home. The pressure is very great, the country is booming, really like unto our own beloved part of America, say 30 or 40 years ago when we began to build roads, great shops, and generally modernize our cities and the communications in

between. Argentina has had several years of rich harvests — big crops and exceptionally high prices — when they get it, they spend it — not like drunken sailors but with a dash that amazes one who knew them so darn well when they were poor. Great public improvements that would make even the New Dealers in Washington sit up and take notice. For example, \$160,000,000 in sewer and drainage for Buenos Aires (a city about the size of Chicago in area, and equally flat) — a boulevard built plumb through the middle of the downtown section of the city, 500 feet wide. They tore out two city blocks of buildings in a swath a mile or more long, hollowed it out underground for cross passages for pedestrians and for parking automobiles, and so on. My gang are heavily interested in not only construction machinery but in building the drainage tunnels of galvanized ingot iron sheets. I run a good-sized shop (130 men working 7:00 A.M. to 10:00 P.M.) and I am busy as a one-armed paperhanger in flytime. Sooooo, you'll understand that the end of a working day finds me blah! Nothing much left. Thanks be to God and my strong Irish ancestors, I can take it. I sleep like a child and the old sleeve of care is all knitted up again in the morning (excepting of course those mornings after those nights before, which of course must be taken on now and then). Life goes along pretty fast. I'm glad I'm here. This country is increasingly a good place to be, as Europe goes to Hell and Japan raises ditto in China, and" (balance deleted for fear of censorship). Jack's interesting letter had attached to it a good-sized check to take care of a feared delinquency on class dues.

Ray Bell, II, takes issue with a Secretary's letter inferring that Bill Motter is a busy man. Listen: "Bill is merely building a new home, but I have been engaged for many months in building a farm and poultry establishment. Bill and I may be on slightly familiar ground in house building but this farm business finds me at the bottom working up. Furthermore, I have been doing the work by day and have undertaken to be my own designer, which requires every available moment to follow through and familiarize myself with the various factors involved, as well as supervise those whom I am paying to do the work. I started with a house of eight rooms, which now has about 17. I started without a garage and now have room for six cars. I started without any poultry establishment, whatsoever, and now have chicken houses over 125 feet in length and will add 50 feet shortly if the weather permits. I have under construction a brooder house to produce 200 broilers a week. I am also going to raise sheep, goats, ducks, guinea hens, and so forth, and while I do not intend to go into the milk business, I suppose I will have about three cows by next spring. With this activity I also make my regular visits to our Boston and Chicago offices, so that I do not have much to offer in the way of time for other things." Ray ends with a suggestion for our "fireplace gathering" at Old Lyme in June that he

feels would be more illuminating than recent ones. Suggestion accepted and referred to program committee.

Ros Davis proves that he was a great Secretary and still is a very valuable assistant by reminding us that Mrs. J. A. Reynolds, whose death was reported in the November issue, was Eva B. Keyes, IV. That Ros was a specialist on coeds is further shown by the information that Mrs. Eliza N. Rogers, who has recently transferred from Exeter, N. H., to 207 South McAlpin Street, West Philadelphia, Pa., was Eliza Newkirk. — Jim Barlow, I, writes that his daughter, having graduated from Connecticut College for Women in 1933, is now teaching at Williams Memorial Institute at New London, Conn.

Harry Stevenson, II, in sending in his pledge for the Alumni Fund Campaign, writes: "Mrs. Stevenson had the operation performed and, although far from well and strong yet, is showing constant improvement. I wish I could help you out with some news. I am the same old small-town enthusiast, with plenty of interesting work at Davis and Furber's, past president of its foremen's club, and treasurer of the Andover Historical Society." — George B. Jones, II, urged to make up some news even if he knew of none, writes: "I have frequent business correspondence with Frank Payne and, in fact, have a letter from him today, but do not know anything of special interest nor have I the originality to make up some scandal about him or C. E. Warren, as you suggest. I understand that Frank's wife runs a very nice and widely known tearoom in Barrington in the summer-time, known as 'The Country Cousin.' Also, Frank has quite a layer of rich, black earth on his farm, which he sells to anyone who would like to improve his lawn.

"I have had a few business matters with C. E. Warren lately but handle most of them by telephone and correspondence. We have been busy in Evans-ton, as in many other cities, with the Community Chest Drive and similar local activities." — Dan Harrington, X, has been named chairman of the Visiting Committee of the Department of Chemistry at M.I.T.

Gene Kriegsman, I, evidently thought, after reading the December notes, that we were hinting at something, for he now offers a silver cup in the Grand Granddaughter Contest, on which Strickland holds the first leg. Gene insists that the cup cannot be awarded to the donor, but really, Gene, the first grand in the title is an adjective. Don't despair. Gene's latest address is Hotel St. George, Brooklyn, N.Y., "still in P.W.A. Region Number 1, 2 Lafayette Street, New York City." All of the above information on a Scotch Christmas card, of which the Secretary has received many from classmates. One from Carl Graesser, II, showed Carl and Grandma Graesser out on a ski party or hunting trip. Carl had apparently shot a Christmas tree, but Mrs. had lassoed a deer; Free-Hand Charlie would be proud of Carl's hand work.



1905 Continued

Fred Poole, VI, writes: "There really isn't any news of particular interest, from yours truly; I have had a moderately good year this year (business and pleasure). Most of my work has been in the Philadelphia area where I could live at home, in Camp Putter. Just now, I'm working with my old friends and associates, Hopf, Kent, Willard and Company of 500 Fifth Avenue, N.Y., and Boston. Willard is '09. We are management engineers and accountants. Oh, yes, this year I was licensed by the state of New York to practice professional engineering. (Only 18,000 others have been so licensed, so it is quite a unique distinction, don't you think?)" Fred waxes enthusiastic at Doc Lewis' speech at the New York alumni dinner early in December. — C. D. Klahr, II, apparently thinks he, too, is "out of" the grandchild contest for he "seems to be a generation behind those pioneers, with a son six years old." C. D. admits having finished a successful year in the highway contracting business.

Louis E. Robbe, I, taking a hint from a veiled request for photos of the 1937 Old Lyme week-end sends a collection for the class album with these comments: "Take the one with Fouhy and Johnston, for instance, as well as the print of Ray Bell's boat. Those scenes about the Boxwood Inn are very attractive indeed, so you can pass judgment on them all and try to live again those happy days of last June. I am sorry to read of the passing of Edward M. Read, who was my company commander in our freshman year. He it was who drilled us and who put us through the troublesome setting-up exercises and caused us to right-shoulder arms, to present arms as a salute to every cop we passed while out on any parade in the street. Those early days of military training have so deeply made their mark that I am still interested in things military and am in the Reserve Corps and take two weeks of active duty at a training camp about every summer. I see Waldemar Richmond of Simpson's Company, drilling at his best and taking the prize for the best soldier of the whole regiment. A fine fellow Richmond was, and it is much too bad that he had to leave us all a few years ago. That is what awaits us all and that is what makes those get-togethers all the more worth while, since our numbers are lessening each year.

"Last summer I went up in Maine and to my surprise I got in without a passport and thoroughly enjoyed a vacation in that state, even though it is regarded by many as somewhat of a foreign land. All the signs erected soon after election must have been removed, for I saw none announcing that I was 'entering foreign territory.' This would be a dreary world if we couldn't have a bit of fun once in a while. With kindest regards and hoping to see you at the next reunion at Old Lyme."

Our autumn get-together at Walker Memorial on November 1 was attended by Keith, Tower, Shapira, Wentworth, Marcy, Barrier, Gilman, Buff, Prescott, Fisher, Curtis, Strickland, and Gold-

thwait. A general committee for the Alumni Fund Campaign was elected as follows: Boggs, Strickland, Kenway, Marcy, and Wentworth, chairman. Chairmen of local committees were appointed in 25 strategic geographical locations throughout the country and 30 subchairmen, operating under the general committee for contact work in the Boston area. Much work has devolved upon the chairman, but Harry, with his well-known organizational and executive ability, has handled this "just a little bit more" in a manner characteristic of busy men. From his contact with Wentworth on the Alumni Fund Drive, the Secretary learned that Harry has just given an exhaustive private paper on a subject that may become of wide importance over the next few years. By a large amount of empirical work over a period of several years, it has been found that the mass action of human beings with respect to enthusiasm or its opposite is apparently affected, at least, by something extra-terrestrial. Harry believes it is due to changes in some sun radiation (possibly some phase of the ultraviolet) affecting us either directly through one of the ductless glands — in the same manner as light affects the retina and heat waves, the skin — or indirectly through the absorption of ionized air, the condition of which apparently changes from time to time with the sun's revolution and position. Bodies other than the sun may also, in his view, have effects, through their gravitational or other action on the condition of the sun.

If this interests anyone to a point where correspondence is provoked, write to Harry personally. While your Secretary sits at the feet of the Course VIII gentlemen and admiringly tries to absorb his cosmic enthusiasm, he is after all only a class secretary, not a biocosmochemic correspondent.

We have a very meager report of the death of Walter A. Clarke, XIII, of Brewer, Pa., on October 24. Requests for details of his illness, his recent history, and so on, made to his family have not brought further details. If more information is received, it will be given in a later issue. — George P. Ireland, I, of Springfield, Mass., died on October 31. A personal friend writes as follows: "The writer knew George P. Ireland . . . very well. He was visiting a cousin in Montclair, N. J., when he was stricken with a heart attack and died at Mountinside Hospital, Montclair, N. J. Burial was in the family lot in Mount Auburn Cemetery, Cambridge, Mass. Mr. Ireland was a unique and interesting person. He devoted his time to travel and study. With the exception of Australia, I believe he had covered all parts of the world, and from my own observation would say his interest centered on South American countries. He delighted in keeping up on his languages, particularly Italian, French, and German, and apparently devoted much time to old Greek writings. Judging from his papers, he had recently, and for a long time prior to his death, worked at some length on the study and

deciphering of Sanskrit. Mr. Ireland was unmarried and lived in Springfield practically his entire lifetime at his own home, 126 Harvard Street."

Bill Spalding, III, writes from Almagordo, N. M. Whether he is prospecting, vacationing, or has taken permanent residence there is uncertain at present. Bill has a long trip to make to Old Lyme, Conn., next June to defend his tennis doubles championship (with Marcy). — Leon G. Morrill, V, apparently has forsaken the Great White Way, as his present address us 11 Albion Road, Wellesley Hills, Mass. — The most important change of address is that of the business address of your Secretary. Call it "forced to larger quarters by the business recession" or what you will, but send news and lots of it to the new address, 274 Franklin Street, Boston. — FRED W. GOLDTHWAIT, Secretary, 274 Franklin Street, Boston, Mass. SIDNEY T. STRICKLAND, Assistant Secretary, 75 State Street, Boston, Mass.

## 1907

The first two paragraphs of our notes this issue were included in the reunion folder sent to the Class in November. We reprint them here as we feel that they are of interest to men of other Classes: As the Secretary has sometimes been asked how many men are now following lines of work directly related to the courses of study taken at the Institute, he studied our Class with this idea in mind and found that 175 of the 240 on the mailing list are thus engaged at the present time. This is 72.9%, a much higher ratio, according to Ed Moreland and Ralph Hudson (both professors at Tech), than the average among Tech Alumni.

We are particularly proud that 1907 is the only Class up to the present time, from whose membership have been chosen three presidents of the Alumni Association: Alexander Macomber, 1928-1929; Ed Moreland, 1935-1936; and Don Robbins, 1936-1937. Another interesting item is our list of 13 classmates who are professors in various institutions of learning. They are: Henry B. Alvord, professor and head of civil engineering department, Northeastern University, Boston; E. Leon Chaffee, professor of physics at Harvard; Hudson B. Hastings, professor of industrial administration at Yale; Ralph G. Hudson, professor of electrical engineering at M.I.T.; Edward L. Moreland, professor of electrical engineering and head of department at M.I.T.; Phelps N. Swett, professor of geography, Middlebury College, Vermont; John G. Barry, professor and president, College of Mines and Metallurgy, El Paso, Texas; Allan R. Cullimore, professor and president, College of Engineering, Newark, N.J.; B. C. Gupta, professor of electrical engineering, Bengal Engineering College, Calcutta, India; Earl H. Reed, professor of architectural design and head of department, Armour Institute of Technology, Chicago; Frank C. Stockwell, professor of electrical engineering and head of department, Stevens Institute of Tech-

## 1907 Continued

nology, Hoboken, N.J.; and Masanao Yendo, professor at Yokohama Technological College, Yokohama, Japan.

Ed Moreland, Head of the Electrical Engineering Department at Tech and member of the consulting engineering firm of Jackson and Moreland, Boston, was a witness before the three-judge Federal court at Chattanooga, Tenn., on December 9, for the utility corporations fighting against the Tennessee Valley Authority's power program. — Early in December the Secretary was in Lynn, Mass., on business and while eating lunch in a restaurant noticed at a near-by table a man who looked familiar. In some way the name came immediately to his mind, though surely 30 years have passed since the last encounter. "Aren't you James H. Fenner, formerly of M.I.T. 1907 and from Providence?" the Secretary asked, and the astonished Fenner admitted all these details to be facts. Fenner is now purchasing agent at the West Lynn Plant of the General Electric Company and lives at 125 Elmwood Road, Swampscott, Mass. He was a Course VI man but did not graduate, and his address has been unknown to both the Alumni Office and the Secretary for many years.

We have to record the death of another classmate: Ernest C. Evans, II, was killed on November 23, when he fell 50 feet while he was inspecting repairs which had just been made on a roof of the plant of Wyman-Gordon Company at Worcester, Mass., where he was employed as safety engineer. Evans was with the American Steel and Wire Company at Worcester from 1907 until 1915, first as draftsman and then as assistant engineer, and for the last 22 years had been with Wyman-Gordon Company, a drop-forging plant making very high-grade parts for aircraft. He had been grief stricken over the death of his wife, Grace, which occurred suddenly from a heart attack on October 16 and apparently became ill while on the roof and toppled to the ground. He had no children.

Stuart C. Godfrey, lieutenant colonel in the United States Army, has been transferred from Panama, where he has been stationed for two years, to the War Department, office of chief of engineering in Washington, D.C. — Under date of November 28, we received a letter from Jesse W. G. Hanford, which was particularly welcome, as it has been many years since we have heard a word regarding this man whom we well remember in Course II of undergraduate days. From 1907 until 1916 he was free-lancing in Spokane, Wash., doing many short jobs in both civil and mechanical engineering on design of lumber mills, power plants, irrigation systems, and land surveying and map making. During this time he spent a year with the Spokane city engineer and two years with the Inland Empire Paper Company. From 1916 until 1922 he was a machinery draftsman at Puget Sound Navy Yard, and then for a year was service secretary at Seattle for the American Association of Engineers. For the next four years he worked on complete sub-

division layouts for various Los Angeles real estate firms and then in 1927 became senior civil engineering draftsman in the office of the Los Angeles County surveyor, where he is now located. He is also a deputy county surveyor and deputy county recorder for the purpose of making certified copies for permanent record of old record maps. Hanford has been married twice and has a daughter nearly 14 years old and a stepdaughter who is 18.

As the result of a telephone call to a brother-in-law in Jamaica Plain, Mass., and an earnest letter, we received a much appreciated communication from Edward F. Kelly, II, who, like Hanford, has been among the missing on our correspondence list for at least 20 years. From 1907 to 1909 Ed took the student course at Erie City Iron Works, and then for four years was a power salesman for New York Edison Company. From 1913 until the present time he has been vice-president of Central Illinois Public Service Company, with an office in the Illinois Building, Springfield, Ill.; we understand he has been very successful in every way. From April, 1917, to June, 1919, he served in the World War as captain of the 301st Engineers. Ed, with his wife and four children (a son 21, and three daughters, ages 17, 12, and five) lives at 1629 South Douglas Avenue, Springfield, Ill. He is president (term July, 1936, to July, 1938) of the Illinois Public Utilities Association. — After a bit of detective work by personal call and telephone, we finally had a fine chat, late in November, with John T. Mahar, II, also unheard from for a long time. Until 1921 John was with the Boston office of the American Agricultural Chemical Company and then became estimator and salesman with the Boston Structural Company. The business situation in 1935 terminated this work and since that year John has been an engineer with the P.W.A. His office is at 600 Washington Street, Boston, and all P.W.A. projects of western Massachusetts go through his hands for approval before going to Washington. John is married, but has no children, and lives at 27 Aberdeen Road, Somerville, Mass.

Under date of November 26, Johnnie Thomas wrote from his office at 111 Sutter Street, San Francisco: "I am in charge of manufacture for the American Can Company on the Pacific Coast, with headquarters in San Francisco. The various plants under my supervision are located at San Francisco, Oakland, Sacramento, San Jose, Monterey, Los Angeles, and the Hawaiian Islands. I usually make a trip to Honolulu once a year. During the past year most of my time has been taken up with labor troubles. I suppose that many of the members of our Class have had similar troubles. I have two daughters, one a graduate of Stanford with a bachelor's and master's degree, and now working on her Ph.D. She has specialized in languages. The other daughter is a graduate of the University of California and lives at home.

"I was very much interested in the class picture on page 36 of the November Review. I still think of the Class as a lot

of youngsters, but when I saw the many gray heads among them, I realized that they were getting along in years. My hair also is turning gray and I feel that I could fit into the picture very appropriately. I was able to recognize practically all of the faces in the picture. What a change 30 years has made in the appearance of most of them!"

Late in November we received a most interesting letter from Laurence T. Walker, VII, which we would like very much to publish, but a very definite request that it be regarded as purely a private and personal communication prevents such procedure. Walker has been in the United States Army since 1909, is now major (retired), and his address is 5065 Canterbury Drive, San Diego, Calif.

In the magazine section of the *Christian Science Monitor*, Boston, October 20, was a full-page, illustrated article, entitled, "Canada's Busy Mr. Howe," referring to our classmate, Clarence D. Howe. This article follows, almost in its entirety, reproduced by permission of the Christian Science Publishing Company, and written by James Montagnes: "Graduates of the Massachusetts Institute of Technology are to be found in all parts of the world, but possibly none has reached a higher post than Clarence Decatur Howe of the class of 1907. He is Minister of Transport in the Canadian Government, and one of the busiest of all Dominion cabinet ministers.

"Prime Minister William Lyon Mackenzie King stated his belief in his 1935 election campaign that some of the government departments should be consolidated, and the cabinet made smaller. He had in mind, for one thing, uniting the many branches of government dealing with transportation and communication. When the election was over and Premier King headed the Government, he called on C. D. Howe, who had run for Parliament for the first time in Port Arthur, Ont., where he maintained an engineering business, to take the posts of Minister of Railway and Canals and Minister of Marine. A year later Minister Howe had evolved the two departments with their many branches and commissions into a single Department of Transport.

"Today Mr. Howe is not often to be found in his office on Parliament Hill in Ottawa. His work takes him all over the Dominion and in recent months he has also spent much time traveling by air throughout the United States, for the immediate major task is the early completion and scheduled operation of a trans-Canada airway to compete with United States transcontinental air lines. So firmly does Mr. Howe want to impress on the Canadian traveling public that a trans-Canada airway is a feasible and safe method of travel, that this summer he made a dawn-to-dusk flight, as a passenger, from Montreal to Vancouver. He played golf on the Pacific Coast after his trip with clubs which he had stowed into the plane that morning.

"Aviation is but one section of Mr. Howe's department. He also has under his control all commercial and non-



1907 Continued

military aviation, which includes the mapping of vast regions of the Dominion's unmapped northland from the air. He also is the last resort in radio broadcasting. Canada's Government-owned Broadcasting Corporation has control of all broadcasting in the Dominion. Everything from checking the copy of radio advertising to hiring the artists and building new stations comes under the supervision of the Department of Transport. Other radio matters, from the operation of amateur short wave stations to the powerful coastal stations which aid shipping, likewise are under his management. He controls the world's only radio interference-hunting sleuths, who average about 15,000 jobs a year, solving 90 per cent of the complaints which listeners register.

"Minister Howe has one of the biggest Government departments in the Dominion, totaling nearly 10,000 employees, with an annual pay roll of about \$7,000,000. In addition to radio and aviation interests, he looks after railroads, ship lines, and the Canadian canals, which alone have an investment value of \$302,000,000. They include the famous Welland Ship Canal, the lower St. Lawrence River waterway, and the Montreal ship channel to the Atlantic Ocean. About 800 docks on both coasts and on the Great Lakes, lighthouses, all aids to navigation, and the seven national ports — Halifax, St. John, Chicoutimi, Quebec, Three Rivers, Montreal and Vancouver — all are his interest. He must see that ships are properly inspected, that officers and seamen come up to requirements. He has 255 floating units, including lightships and icebreakers, and the Dominion's shipyards come under his supervision.

"The biggest problem is to make the Canadian National Railways a paying proposition. It has been a heavy expense to the taxpayers, and for years has been a political football. One of Mr. Howe's first acts was to reorganize the controlling group, placing responsibility on seven men who were in turn responsible to him, and thus to Parliament. — In the first year of operation of this board, Mr. Howe reported he had cut the annual deficit by \$5,000,000. Mr. Howe also is Canada's number one tourist agent, for the Canadian Travel Bureau is another branch of government he took over. And there are the grain elevators, the cold storage buildings, the warehouses, and the vast slices of real estate owned by the department along canals and on the seacoasts, which his department operate or rent to industry.

"Premier King has assembled a number of young men in his Cabinet. Hon. C. D. Howe comes in this group. He was born in Waltham, Mass., 51 years ago. After his graduation from the Massachusetts Institute of Technology, he became an assistant instructor there. On leaving his alma mater he became a professor of civil engineering at Dalhousie University in Nova Scotia. He remained there five years, but in 1913 he was named chief engineer to the Dominion Board of Grain

Commissioners. During the early days of the Great War it was his task to see that the grain crops moved eastward from the Canadian prairie provinces.

"Then he started his own engineering organization, C. D. Howe and Company, with offices at Port Arthur. There followed in quick succession the building of grain elevators at Moose Jaw, Saskatoon, Vancouver, and at the most northern seaport of Churchill on Hudson Bay. He built elevators for private interests and for the provincial wheat pools. Pulp mills, coal docks and other heavy engineering structures were constructed. His projects totaled more than one hundred million dollars in value during the 19 years he was in business, and his fame as a grain elevator builder grew worldwide. He put up some of the world's largest grain storage pits and invented many labor-saving devices useful in the grain-carrying business.

"In 1932 the London banking firm of Baring Brothers sent Mr. Howe to the Argentine to plan the erection of a line of country elevators. As a result of that South American trip he learned Italian and Spanish. He used his Italian later to address a political meeting of Italians during his only election campaign at Port Arthur. A knowledge of French has helped him to become well-liked by the French-Canadian members of Parliament. His many years in business, as a worker and an executive, have taught him how to get along with those under his direction. He does not interfere with the section heads of his department, but he expects the tasks set to be done properly. In the two years he has been minister, he has earned the loyalty of his associates.

"During the last two years Mr. Howe has co-ordinated all phases of transportation and communication already under Government surveillance in Canada. But a big job ahead is the Government regulation of all trucking and highway traffic. At present this is under provincial supervision throughout the Dominion. An attempt has been made toward regulation of motor traffic by the Federal Government, but opposition so far has defeated the proposals Minister Howe has made. This winter another attempt will be made to regulate commercial highway traffic from Ottawa in such a way as to protect provincial rights. Similarly shipping on the Great Lakes must be better regulated by the new Department of Transport, to give uniform rates.

"When the stocky Minister of Transport goes on a survey trip, his piercing blue eyes overlook very little. On his dawn-to-dusk Montreal-Vancouver flight, he found that the weather-reporting service was not all it should be. The meteorological service of Canada being under his control, as part of the old marine department, weather reporting now is being greatly improved, but its failure to satisfy Mr. Howe was one reason why the trans-Canada airway did not go into operation last summer . . .

"An engineer by profession, Mr. Howe is in charge of a Government department which has need of many engineers. So

152 professional engineers are on the pay roll, specialists in the many phases of transport and communication. The need of engineers is great, Mr. Howe believes, for he regards his department as the operating center to maintain an investment in public works amounting to about a billion dollars. When he has any spare time Mr. Howe plays golf or bridge. But his spare time is limited." — Clarence was the principal speaker at the 38th annual banquet and ladies' night of the Canadian Club of Boston on December 15. — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

After a sojourn of about two and one-half years in England, Germany, Holland, Switzerland, Italy, and so on, Carl Gram is back in the United States, looking as fit as in the days when he used to "burn up the cinders." Apparently the Englishmen cannot understand how he can get any fun out of life, working as he does, but I really think Carl is slipping, for he admitted the other day when we had lunch together that now he quite enjoys his tea at six minutes after four. Hazel and Carl, Jr., came back with him — Carl, Jr., being now employed by the Mason-Neilan Regulator Company. Alberta is studying voice in Dresden, Germany, while Gloria is in school in Lugano, Switzerland.

Harold Lang writes: "I am still holding the position of professor of biology and public health here at Carnegie and since 1929 have been head of the department of science in the Margaret Morrison College for Women of this institution, teaching some courses in the Engineering College as well. It is one of my great regrets that the reunions always come right at our commencement time, when it is impossible for me to be away from the college. Now and then some '09 members get around to our local alumni meetings, Tom Spooner, Molly Scharff, and myself being present at the last one." Harold has a son now attending Harvard Medical School.

Mr. and Mrs. Richard Krementz of Elizabeth, N.J., and Camden, Maine, have announced the engagement of their daughter, Nancy, to John M. S. Hutchinson, son of Mr. and Mrs. B. E. Hutchinson of Detroit, Mich., and Jamestown, R.I. Miss Krementz attended Vail-Deane School, Kent Place School, Summit, N.J., and Smith College. Mr. Hutchinson attended Exeter Academy and was graduated last June from Harvard University. He is employed in one of the automobile plants in Detroit. (Could this be Chrysler, by any chance?)

From George Wallis, our Chicago correspondent, comes the following: "I do not seem to send you much news but thought that you would like to know something about the recent Technology dinner at the University Club here in Chicago, where the local Alumni were hosts to our President, Karl T. Compton,

1909 Continued

and another prominent Tech man, Arthur C. Willard ['04], President of the University of Illinois. This dinner was well attended, with a turnout of 222 men, and after a very interesting speech by Dr. Willard, we listened to a splendid talk by Dr. Compton, in which he outlined, in a comprehensive and characteristically straightforward way, the new development program of the Institute. Our Class was represented by John C. Bollenbacher, Leon J. D. Healy, Harvey S. Pardee, and the writer. I am sorry that Edward L. Ryerson was unavoidably prevented from being with us, as he had previously advised us that he would be there. I do not need to tell you that Ryerson is one of the prominent citizens of Chicago and besides his duties as chairman of the board of Jos. T. Ryerson and Son and vice-chairman of the board of Inland Steel Company, he is closely identified with most all of the worth-while local civic movements.

"Bollenbacher's architectural firm is prominent among the profession here in Chicago and vicinity, and at present he has two large projects in progress, one of these a new medical and dental building for the University of Illinois on the Chicago campus and the other a courthouse in Oshkosh, Wis. As an indication that he has full confidence in his own ability, he has recently designed a new home for his own use. — Healy told me that he is vice-president of the Wright Rubber Company in Racine, Wis., and also that part of his time was spent in consulting work with a number of other rubber and plastic-goods manufacturers. His home is in Milwaukee, and I should judge that his favorite sport is boating on Lake Michigan, weather permitting. — Pardee is an inventor and is in the happy position of collecting royalties from a number of prominent firms. His work also includes investigation of new developments and processes on a consulting basis. His oldest daughter is now studying in Oxford University, England, after finishing her university course in this country.

Just the other day I received from J. N. Stephenson a copy of the *Pulp and Paper Magazine of Canada*, of which Steve is the editor-in-chief, giving a most interesting account of a transcontinental trip taken last summer by "the vagabond editor," some 5,900 miles by rail, 1,900 by water, 500 by bus — 19 paper mills visited. I quite envy Steve and hope some day to be able to visit the Canadian Rockies myself. The magazine also had an article on "Forestry and Logging on Vancouver Island," a story of definite planning for a perpetual, low-cost supply of pulpwood timber now being carried out under a program of the B. C. Pulp and Paper Company. — Chick Shaw's boy, Bradford, was graduated in June from the engineering department of Tufts College. — Francis C. V. Crowley, now a lieutenant colonel, has been transferred to Fort Ringgold, Texas; Arnim F. Herold has become a major at Barksdale Field, Shreveport, La. Congratulations to both of these men on an advancement in rank!

Paul M. Wiswall says: "Dale Ellis sailed on the 15th for England to spend Christmas with his mother who is now over 80. He will be back about the first of February. — 1909, as usual, turned out well at the Technology club dinner on the ninth [New York City]. All told, about 600 men filled one of the roof ball-rooms at the Astor to make the biggest Tech affair ever held outside Boston. The Class was represented by Tom Desmond at the speakers' table. Tom spoke in his official capacity as chairman of the Alumni Fund Drive. John Mills reports for the other speakers: 'We agreed with much that Professor Lewis (Warren K. Lewis '05) said and glorified in the Institute's accomplishment and program of progress as developed by Dr. Compton. But the statistics of the alumni contributions which were presented automatically convicted some of us and we went home determined to look over our budgets and make early subscriptions.' Since the Assistant Secretary of the Class here in New York is also the one to canvass 1909, I hope many of the New York men will take John's hint to heart. At our table were John Mills, Fred King, Henry Colson, John Willard, Laurence Forrest, Lewis Johnson, Hardy Cook, and ye Scribe. We adopted for the occasion two 1908 men: Gibbons and Dexter. Molly Scharff came in later in the evening after the Exeter dinner that took place the same night." — CHARLES R. MAIN, Secretary, 201 Devonshire Street, Boston, Mass. Assistant Secretaries: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

## 1910

Again it is the sad duty of your Secretary to report the passing of two of our classmates: Charles P. Randolph, Jr., passed away on November 30. The following excerpt is from the *Chicago Tribune* of December 2: "Mr. Randolph was a graduate of the University of Texas and took graduate work at the Massachusetts Institute of Technology. From 1911 to 1918 he was with the General Electric Company at Pittsfield, Illinois, where he assisted in development of electric ranges. In 1918 he came to Chicago as chief engineer of the Edison General Electric Appliance Company. He was credited with important contributions to heating units and styling of electric cooking devices. Surviving Mr. Randolph are two daughters, Gloria and Barbara." — On November 15, Lasley Lee died of pneumonia in Cleveland, Ohio. At the time of his death, he was district engineer of the United States Geological Survey. He came to the Institute from Lafayette University of Easton, Pa. After graduation he went with the United States Geological Survey and was stationed in the far West until appointed to the Cleveland office.

Chester W. Wilson called upon your Secretary recently. Wilson lives in Newton and has been in the engineering and manufacture of drugs since his graduation. — HERBERT S. CLEVERDON, Secretary, 46 Cornhill, Boston, Mass.

## 1911

At this writing Old Man 1937 has just a few days to go and we find that 44 classmates, or one more than one-ninth of our mailing list, have subscribed \$3,485 to the Alumni Fund, which, in the light of the unsettled national and international affairs this fall, is not discouraging. With the advent of 1938 — and it will be nearly a month old when these notes appear — the drive is apt to gain impetus, and all of you '11 men who have not yet boarded the band wagon are earnestly urged to do so.

Young Dennie, whose hospitalization at Maine General in Portland following his Armistice Day auto accident lasted three weeks, has convalesced most satisfactorily here at home in Worcester, and the doctors agreed he could rejoin his freshman classmates at Bowdoin right after New Year's Day.

Answering the write-to-Dennie urge recently, Edgar Woodward, VI, Western Mechanical editor of *Railway Age* and Western editor of *Railway Mechanical Engineer*, both magazines published by Simmons-Boardman Publishing Company, made the following assertion: "The average M.I.T. graduate, who does not achieve spectacular results in engineering, business or politics, unfortunately is not in the 'news.' He plays the game squarely and to the best of his ability and must take a substantial share of his remuneration in the form of love and esteem, which he wins from his family and little coterie of personal friends. In my experience this by-product of life's activities has been a most gratifying end in itself." Read those last two sentences again — aren't they fine? Continuing, Ed says that during the past year or two he has taken a more active interest in civic affairs, and he inclosed a copy of a sketch written for the press at the time of his recent election to the board of trustees of the village of LaGrange Park, where he lives. From 1911 to 1917 Ed was in railway service on the New York Central and the Boston and Maine, leaving the employ of the latter road in mid-1917 to become an associate editor with his present company, starting in New York. Came the World War and Ed went overseas with the 35th company, transportation corps, American Expeditionary Force. When he returned in 1919 he married Carolyn L. Fletcher of Brooklyn, N.Y., and the couple has two children, Natalie C. and Doris Jean.

Returning to civil employment in the fall of 1919, Ed was transferred to Chicago and assumed the positions he still holds. He is now a member of the executive committee, Chicago section, American Society of Mechanical Engineers; Americanism committee, LaGrange Post 41, American Legion; board of trustees, village of LaGrange Park; and member of the board of trustees, LaGrange Baptist Church. His recent professional activities have centered largely around modern high-speed passenger trains and included an analysis of the requirements of motive power and car equipment for this type of



## 1911 Continued

service, as well as assembling comprehensive descriptive data covering all of these trains which have been placed in service in the West and Middle West in recent years. He lists his diversions as handball, fishing, occasional vocalizing in a male quartet, chess, and checkers. — Thank you, Edgar, for one of the finest letters I have ever received; it is gratifying to learn that you so enjoy the class notes which have been presented with regularity ever since graduation. My earnest hope is that my presentation of your letter's high lights will lead to a more general writing of letters on the part of classmates.

Lloyd Cooley, X, came to bat with a newsy letter just after Thanksgiving. He also is in Chicago, he and Treva residing at 7438 Kingston Avenue, where the latch is always out for '11 men. He said he was planning to attend the Exposition of Chemical Industries in New York, the second week in December, and told of running into Carl Richmond, II, recently in Buffalo, where both were on business trips. Lloyd thoughtfully inclosed the page from November *Yachting* which featured Nat Seeley, whose 1937 Christmas card, by the way, was another gem of family life pictorial presentation. As we said last month, we hope you saw and read that salty snap and interesting word picture of our classmate, Nat, who is at present vice-commodore of the Cruising Club of America. Therein it says, for example: "Summer or winter, he and his boat are inseparable. Hardly a gathering of this cruising and ocean racing organization do the pair miss. . . . In 1929 he had the 55-foot motor-sailer 'Lady Lou' built and in her he shoves off for any place at a moment's notice. . . . Wherever the 'Lady Lou' drops anchor, her spacious cockpit is sure to be filled with the crews of all the other cruisers in the harbor. That's the kind of a ship she is."

Accompanying a generous pledge to the Alumni Fund, Bill Warner, I, writes from his arid area, Nowata, Okla. (pardon the pun), that his oldest son left this fall for a two years' job in South America as a geologist for one of the Standard Oil companies. Bill and his wife have two other sons, one in college and the youngest in a military school. "It has always been a source of great gratification to me," he writes, "to see the way the Alumni have taken an interest in Technology, especially in the amount of time given to different activities, such as you have been doing for so many years. This work and interest by the Alumni is what has made Tech such an outstanding institution. I only hope that some time it will be possible for me to help in a material way." Another fine letter — take heed, classmates, obey that urge!

From the Alumni Office we learn that George Sullivan, X, is now with the Independent Coal Tar Company, 88 Broad Street, Boston, and Laurence Watts, I, has been promoted from major to lieutenant colonel, United States Army, being stationed at the New York General Depot, First Avenue and 58th Street, Brooklyn. From *The Tech* we learn

that Heinie Zimmerman, IX, delivered, to seniors and graduate students of M.I.T. on December 3, the fifth of a series of lectures on placement training, taking as his subject: "Opportunities in Industry." Young Charlie Hobson '39 was one of nine students honored in early December by election to the Technology chapter of Pi Tau Pi Sigma, national honorary signal corps fraternity.

Two welcome letters just reached me from classmates in New York, telling of the successful annual dinner of the Technology Club of New York at the Hotel Astor, December 9. Livingston Ferris, VI, wrote that in mid-December he was just about to start on a holiday trip South with Mrs. Ferris. They planned to pick up their daughter, Eloise, in Charleston, S.C., where she is attending school, and then go to his mother's plantation in Louisiana for Christmas. Their son, Livingston, 2d, was to join them there, coming from the University of Colorado, his dad's original alma mater, where the son is now doing some graduate work. After New Year's, Livingston and Mrs. Ferris planned to spend a little time in Florida before returning to New York. — Harry Tisdale, V, said he had heard recently from Joe Harrington, VI, now in the Middle West, telling that things were breaking nicely for him out in the Chicago area and that he and Rose were coming East for Christmas.

In closing I wish again to express my appreciation of the many classmates who remembered me with Christmas greetings. Carl Richmond's fine family group was a gem of candid camera art; Don Stevens' card was graced by a superb mountain and lake reflection picture, taken by Read Stevens when he accompanied his family on a recent vacation trip; Emmons Whitcomb's airplane message was decidedly unique; and so I could go on and on, far into the night. As you all conclude reading these notes, I earnestly hope that the New Year and many years to come will have much of value for every one of us. — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

The activities of the Technology Club of New York and the M.I.T. Club of Northern New Jersey result in the occasional gathering of some of our classmates. Late in November your Assistant Secretary met Harold Brackett, VI, H. H. Griffin, II, and Bob Wiseman, VI, at the Newark Athletic Club, where Dr. Compton addressed the New Jersey men and showed them pictures of the present and proposed athletic and recreational facilities in Cambridge.

At the great alumni dinner at the Hotel Astor on December 9, the Class got together 15 strong. There were present David Dasso, II, Norwood A. Hall, VI, John H. Lenaerts, VI, Harold H. Griffin, II, Robert J. Wiseman, VI, Randall Cremer, I, Joseph I. Murray, VII, Ernest Nicholson, I, George H. Rhodes, II,

Cecil B. Vaughan, II, Eugene T. Marceau, X, Page E. Golsan, VI, Edmund B. Moore, VI, Eric Kebbon, IV, and David J. McGrath, I. Besides enjoying a good turnout of the Class, we had the satisfaction of having among our group the distinguished architect, Eric Kebbon, whose design for the new cage and field house unit was shown in the November issue of *The Review*. A telegram was received from Van Syckel, expressing regret that he couldn't be present and sending his best wishes to the gathering. There was some discussion of the suggestion, passed along by Harold Manning, that we have annual meetings in various cities instead of only the five-year reunions at Cambridge. There is something to be said on both sides of this subject. Some feel that you can work up enthusiasm and get most everybody who has any interest in a reunion to turn out once in five years, whereas an annual affair will simply dilute the attendance. We, in New York, believe that we might be able to stage an intermediate and fairly successful party, say in 1939 or 1940, two or three years before our 30th anniversary comes around. We'll be glad to hear from anybody who may have a viewpoint on this subject.

To date [written in December], only 30 members of the Class have subscribed to the Alumni Fund. Will you make it a point to send in a subscription promptly, in order that we may improve our percentage of subscribers? Your Secretary had a pleasant chat with N. A. Hall, of Electrolift, Inc., at the New York Chemical Show, where we were exhibiting. Bob Wiseman also stopped in for a few minutes. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. David J. McGrath, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N.Y.

## 1913

Charles G. Fallon — Jerry — used to call signals for our class football team. Jerry was the wit of this outfit, which was, looking back, quite a conglomeration of boys and uniforms. Now, 28 years later, Jerry writes a letter to show that his wit has mellowed with age. I am glad to print his letter in full: "By next spring, those of our Class who have been wearing toupees or sprinkling gray hairs with Dr. Durand's Acme hair rejuvenator will have to face the world and tell the little ones that it is 25 years since grandpa cribbed his way through Tech and stole a degree. While grandpa might have to take a back seat in the future and cease his great impersonation, no tears should be shed, for it certainly should be worth while; in other words, aren't we all going to have a hell of a good time at the 1913 reunion?"

"Your correspondent expects to attend and is taking all reasonable means to make certain that he is properly notified as to where and when the commotion will occur. Inasmuch as you are about the best Secretary that any Class anywhere ever had, you will please consider yourself petitioned to include me

## 1913 Continued

in any notices that may be issued in reference to the above event. In exchange for such information the undersigned agrees to file no complaint of the fact that for 25 years, he has failed to get a single communication from the Class of 1913 relative to any event ever held at any time anywhere despite the fact that he alone, single handed, practically won the war for them. Seriously, I have never been listed on the 1913 list, probably because I took my degree with '14. We will have to start work for the reunion; we want to make it a very successful one and I want to do as much this year as possible. We made Chatham a good time."

Harry Peck has, too, a spark of wit in his make-up. Harry received, last fall, an engraved card from our J. B. Farwell, announcing a change of residence from 38th Street to 15 Park Avenue, New York City. Upon receipt of this card Harry went to the typewriter to send Jack a makeshift card announcing a change of socks on the part of Harry Dexter Peck, "from the left foot to the right foot and vice versa." Evidently Jack failed to impress Harry with the importance of a residence on Park Avenue. — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R.I.

## 1914

The big event of the past month occurred in New York on December 9 — the occasion being the annual dinner of the Technology Club of New York. Before the dinner Charlie Fiske staged a little reunion party at which 18 classmates and a few guests from other Classes were present, then all repaired to the dinner, comfortably able to stand the contest. A few small private parties followed the adjournment. Those from '14 answering the roll call were George Perley, Tom Duffield, Tom Richey (Captain in the United States Navy), Al Henriksen, Jack Hines, Chet Ober, Frank Somerby, Herman Affel, Art Peaslee from Hartford, Walter G. Hauser, Dana Mayo, Thorn Dickinson, Bert Hadley from Bridgeport, O. C. Hall, Ben Rauber, Alden Crankshaw, Charlie Fiske, and your Secretary. E. C. Crocker was across the street from the dinner at the International Casino, wholly oblivious to the fact that a '14 party was in progress, and F. C. Atwood was also in New York and likewise claimed innocence of knowledge of the dinner.

Warren Horton was a recent speaker before the Technology Dames on the subject of television. — O. C. Hall is responsible for the business management of the Ridgewood (N.J.) Gilbert and Sullivan Opera Company, which gave three productions of "Iolanthe" in late November. — Your Secretary had the pleasure, recently, in stopping off at New Haven, to see Roy Parsell, who is now in charge of patent activities for the Winchester Repeating Arms Company. — Dean Fales gave one of his automotive talks in Providence early in December before the Providence Engineering Societies. — Norman MacLeod was present,

and told Dean that he had recently acquired a large farm in southern Rhode Island and was going in for farming in a thoroughly scientific manner, as a supplement to the machine tool business.

K. L. Wildes '22 of the Department of Electrical Engineering was in China last summer, and while he was there two Technology clubs held meetings in his honor. At the Shanghai meeting on June 8, he was greeted by Paul H. Hsu, V, and at Nanking on June 16, by Y. M. Chu, VI. — The sympathy of his many friends is extended to Bob Patten for the profound loss he suffered on December 3 in the sudden death of his wife in Chicago. Bob and his wife had been making their home at the Carleton Hotel at Oak Park, Ill. They have no children. — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N.Y.

## 1916

The annual dinner of the Technology Club of New York, held at the Hotel Astor on December 9, proved to be an echo of our 20th reunion. Those present from '16 were Marshall Wellington, Freeman Clarkson, Jim Evans, Gilbert Gaus, Joseph Farhi, Richard Fellows, William Kniesner, Robert Wilson, Steve Brophy, Joseph Minevitch, Walt Binger, Ralph Davies, Herb Mendelson, Russ Lowe, John Freeman, Jr., Laurence de Labarre, Bob Naumberg, and Rusty White. This dinner took place during the annual Society of Automotive Engineers Convention in New York City, which situation prevented Joe Barker from attending. Bill Barrett was otherwise engaged for the evening and sent his regrets.

On the morning of the dinner the New York Times carried the following notice: "Thomas D'A. Brophy, first vice president of Kenyon and Eckhardt, Inc., has been elected president of the organization, succeeding Henry Eckhardt, who becomes chairman of the board, the agency announced yesterday. Otis Allen Kenyon remains treasurer. Prior to joining the agency in 1931, Mr. Brophy was vice president and chairman of the sales committee of Revere Copper and Brass, Inc. He was formerly in charge of sales research and development for Anaconda Copper Mining Company." In recognition of this event, Steve donated to the dinner ample liquid refreshments. The dinner also was somewhat of a celebration for Walt Binger, who had just been elevated to the position of commissioner of borough works for the borough of Manhattan.

In an attempt to round up classmates for this dinner, Jimmie Evans and Bob Wilson heard from Joe Meigs; John Gore at Canajoharie; Bill Leach, Niagara Falls; George Tuttle, Buffalo; Hal Gray at Syracuse, who is with the Benedict Manufacturing Company, hotel and soda fountain accessories; Dick Knowland; and R. Gilman Smith. It is encouraging to have replies that at least indicate some class spirit. This is intended to be a prod to those members of the Class who have

not answered your Secretary's appeals for news, even though a stamped, self-addressed envelope has been inclosed.

Charlie McCarthy of the Chance-Vought Corporation, East Hartford, Conn., gives me this choice bit of news concerning our long lost Rafael Alfaro-Moran: "On a recent visit to New York I had the pleasure of dining with Bill Farthing and an old friend and classmate whom I haven't seen since that now long ago day when we graduated from the Institute. It was none other than Rafael Alfaro. Raef is now living in northern California but was in New York on a business trip in connection with the coffee business, which has been his principal interest for some years. Shortly after graduation he returned to his native El Salvador and went into the coffee business, which he has learned literally from the ground up. He has grown coffee on the high slopes of the Salvadorian hills and has designed, built, and operated a coffee mill of unusual design. He then interested himself with the distribution of the coffee to the export market. That certainly covers the field pretty completely." — Let us hope that Raef will see these notes about himself and furnish your Secretary with his present address and some kind of story of his wanderings.

Steve Berke, who has been unusually busy this fall scouting new work for his construction firm, has connected up with some work for the New York State Barge Canal at Herkimer, N.Y. Classmates in that vicinity please note. — We are sorry to learn that Don Webster has been laid up for some time at Palmyra, N.Y. Here is hoping that the new year will bring a new deal of good health to Don. — Those who have been concerned about the present Democratic recession in business will be interested to know that Hen Shepard finds that his company has enjoyed the best bowling season ever. Hen, as you know, has been developing, with considerable success, a personalized bowling ball.

A bit of foreign news comes to us concerning Laurin Zilliacus, X, who is now headmaster of the Tolo Svenska Samskola, in Helsingfors, Finland. During the time he was at the Institute he worked with the Boston North End Settlement, where he was in charge of boys' clubs. After graduation he spent seven years at Bedales School in England, as housemaster and senior science master. He later returned to Finland and founded an experimental school in Helsingfors, of which he is still headmaster. He has been a member of the executive board of the New Education Fellowship since its inception and is at present the chairman of the executive board. With his wife, son, and daughter, he visited Australia on an educational mission last summer.

Classmates going South will surely want to have I. B. McDaniel's address. It is 894 Oakdale Road, Druid Hills, Atlanta, Ga. — Dexter North recently resigned as chief of the technical division of the United States Tariff Commission and has set himself up as technical con-



1916 Continued

sultant, Investment Building, Washington, D.C. He is offering special services on research and technical activities in Washington, D.C., with particular attention to tariff, customs, and other technical matters requiring personal attention before government agencies.

It is with deep regret that your Secretary records in these columns the death of an able classmate, Bailey Townshend. I am indebted to Jimmie Evans for the following notes: "Bailey Townshend, age 42, who for the last seven years had been manager of the research laboratories at the Manville, N.J., factory of the Johns-Manville Corporation, was found dead on the morning of October 18 at his home, in Plainfield, N.J. Dr. Townshend . . . resided at 721 Division Street, Plainfield. Besides his wife, he is survived by two sons by a former marriage.

"Born September 27, 1895, in New York City, Dr. Townshend studied at Dresden University, Dresden, Germany, prior to entering M.I.T., where he graduated in 1916 with the degree of doctor of science. He engaged in research at M.I.T. until 1917, when during the War he served as meteorologist in the aviation division of the United States Naval Reserve. From 1919 until 1922 he engaged in research and graduate study and was an instructor in physics at M.I.T. and during the following year was instructor in physics at Yale. From 1924 until 1928, Dr. Townshend was engineering assistant to the President of the International Business Machines Corporation, and in 1928 he became chief physicist at the J-M Research Laboratories at Manville, N.J. Upon the death in 1930 of A. M. Hamblet [02], manager of Johns-Manville research, Dr. Townshend was made manager of the laboratories under W. R. Seigle, J-M's director of research." — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

## 1917

The Springfield, Mass., *Republican* has published an excellent résumé of the career of J. Talmage Woodruff, who died early on the morning of December 18. By those who had not been in touch with him since graduation, he will be remembered as Joe Battis, genial and popular. He was a member of the 1917 *Technique* board and had many friends, a number of whom followed closely and with great interest his subsequent professional work.

"Mr. Woodruff was born in Colorado Springs, Colo., June 30, 1894, son of Joseph M. and Maria A. Talmadge Woodruff. He lived for a number of years in Salem as a young man and attended the Massachusetts Institute of Technology from 1914 to 1917, leaving college to enlist as a private in the 23d Engineers during the World War. Following his return to civilian life he studied at Boston University for a year.

"He married Miss Dorothy Gray of East Orange, N.J., on June 12, 1920, and came to Springfield where he was em-

ployed as an efficiency expert at the plants of the Package Machinery Company and the Bay State Thread Company. In 1921 when the Technical Advisory Corporation of New York laid out Springfield's zoning plan, Woodruff became associated with that organization in Springfield, later in West Springfield, and also in the 1922 industrial survey conducted jointly by the Springfield Planning Board and the Chamber of Commerce. From 1923 to 1928, he was engineer and consultant of the Planning Board under a city contract and also served as consultant on city and town plans for various New England communities.

"In 1929 Woodruff was engaged as engineer by the Regional Planning Federation of the Philadelphia Tri-State District, which embraced Pennsylvania, Maryland and Delaware, and he remained in that position until 1931 when the Greater Pennsylvania Council made him chief of its bureau of planning. Political changes put this organization out of active existence in 1932. A short time later, Woodruff returned to New England as consultant of the Fairfield County (Conn.) Planning Association with headquarters in Stratford, Conn. He held that position actively for two years, at the same time serving widely through Connecticut as a private planning consultant. . . .

"In 1933 Mr. Woodruff joined the faculty of Massachusetts Institute of Technology as [lecturer] in municipal and regional planning, a part-time connection which continued to the time of his death. In this capacity he has taken classes of students to Springfield and other cities to show them regional planning in practical operation and his classes were popular with M.I.T. undergraduates not only for their subject matter but because of the keen wit and enjoyable personality of the man himself, characteristics which had made his circle of personal friends as wide as his professional contacts.

"When the country was divided into 12 regional planning districts in 1934, Woodruff was named consultant to the National Resources Committee in District No. 1, commonly known as the New England Regional Planning Commission. He held this position at the time of his death and had traveled widely through New England in the past three years both in his part-time Federal capacity and as private consultant. He continued to live in Stratford until April, 1935, when he leased the historic Colton house in Longmeadow and moved there with his family.

"His private consulting work, much of it in Connecticut where he was well known, in the past year had included special work for the Springfield Planning Board, which called him in several times on a fee basis. In his Federal post he was actively connected with long range planning for the development of the Connecticut Valley. Mr. Woodruff was a member of the National Conference on City Planning, the American City Planning Institute, the National Association of Planning Officials, the American Civic Association, Delta Psi Fraternity and the

Springfield Library Association. He had written a number of authoritative articles on planning for various publications."

Stan Dunning penciled a note saying that Penn Brooks returned in November from a hunting trip in Quebec and "had not worked so hard since the Argonne." Said Mr. Brooks is reported to be in good health and showing it. Stan inclosed a clipping from one of the technical journals announcing the election of Dean H. Parker as president of the Philadelphia Paint and Varnish Club on December 2. Dean is still with E. I. du Pont de Nemours and Company, Inc. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

## 1918

Citizens of Rome, N.Y., face the agitating prospect of a new commissioner of fire and police — our own Dick Wilkins, Vice-President of the Revere Copper and Brass, Inc. Having just been tagged for wrong parking, we are virulently unresponsive to the police part of it, but a good fire is a flagrantly entertaining social event. Dick himself says: "My first official act will be to dust out the cell block in the old bastille, so as to be able to provide pleasant and familiar accommodations for any of the classmates who might be impelled to drive through our fair city. At the present writing I expect to sail on the *Rex* on January 5, headed for Vienna, this being in the nature of a business trip, so that if you want to get through upstate New York without being challenged by the minions of the law, you had better come this way in January or February when we will have a good-natured deputy commissioner on duty.

"I move around the country quite a bit but seldom see any of the members of the Class. My principal handicap lies in the fact that I do not stay long in one spot and, therefore, get little opportunity to look anyone up. I did receive a note from Packy MacFarland a few weeks ago. He seems to be hale and hearty and full of prosperity, so that as far as this one, lone contact is concerned, my report is favorable. I guess it is a good thing that I am the only member of the Class that seems to have strayed into the copper business. — I haven't seen your name in the book reviews recently. What's the trouble?"

On November 4, Bridgeport had an M.I.T. dinner furbished by the presence of Ed Meade, Earl Greenleaf, Philo Shelton, and Gretchen Palmer. The real story, however, concerns the dinner in New York where Gretchen was a lone but unabashed female, subject to the despotism of bellhops who were positive she did not belong and to the comical naïveté of reporters, who did not know that M.I.T. was coeducational and who demonstrated a proud, sensitive chivalry by introducing her to the Class of 1919 as Mrs. Somebody-or-Other. (Now if that isn't garbling a good story, we'll lay down our Underwood and go back to milking.)

1918 Continued

Present were Otto Lorenz, Art Windle, W. R. Herfurth, Tom Brosnahan, Ev Rowe, Phil Dinkins, Grannie Smith, Elliot Harrington, Sax Fletcher, Bill Foster, and the above mentioned. Phil Dinkins decided to get the statistical part over with, so he calculated that those present averaged one and four-elevenths children per person, Sax Fletcher leading with a generous four, Ev Rowe coming next with three, Phil himself winning the latex nipple with the youngest — aged 14 months. — Anybody else?

Bill Foster attended the coronation last June but refuses to be interviewed before our reunion next June. Perhaps Shorty Carr — toastmaster par excellence — will get him to speak at the dinner. Tom Kelly is going to chairman the sporting events, Gretchen and Ralph Mahony to circularize the brethren, choose a date, and select the location. So be prepared to vote on whether you want your wife at the reunion and how much a second edition of the 18th Amendment would be worth to you. — F. ALEXANDER MAGOUN, *Secretary*, Room 5-328, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

## 1919

Having in mind the approaching 20th reunion in 1939, it was certainly gratifying to receive word from New York of the annual dinner of the Class, at which the following were present: A. R. Wiren, M. F. Connors, H. P. Jewett, J. W. Meader, F. D. Porcher. This is very encouraging news and the turnout would undoubtedly have been better but for the holiday season. With the number of the Class in and about New York City there is no reason why there shouldn't be at least 20 at class get-togethers, which attendance figure has been exceeded by the majority of the Boston dinners during the last two years. Wiren has written me personally requesting that all members of the Class in and around New York become members of the Technology Club of New York, 22 East 38th Street, New York City.

We received an interesting letter from Paul Swasey, who is with the Virginia Electric Light and Power Company, Norfolk, Va. Paul misses Boston and his frequent contact with M.I.T. men in this section, and each summer visits his home in Vermont and then enjoys the mountains, boating, and swimming around Lake George the rest of the time. Previous to July he was located in Fredericksburg, Va., and while there Max Untersee spent several week-ends with him. This is the first news I have heard of Max for some time, since he was an architect in Boston the last I knew. In Fredericksburg, Paul was sales manager of the company for that district and is now looking after the commercial and industrial sales around Norfolk, trying to impress upon industry in this section that the power company is not the big, bad wolf.

An interesting clipping appeared in the New York *Herald Tribune* stating that the Society of Naval Architects and Marine

Engineers had awarded the Linnard Prize to K. S. M. Davidson of Stevens for a paper on "Some Experimental Studies of the Sailing Yacht," given before the society at the 1936 meeting. The article went on to state that this study influenced to a considerable extent the success of the design of the America's Cup defender, *Ranger*, in the races held with the British yacht, *Endeavour II*, off Newport this year. Ken has been assistant professor of mechanical engineering at Stevens since 1930 and director of the experimental towing tank.

There appeared in the Boston *Post* an item stating that Carl W. Phelps, a native of Dorchester, and his wife would return to their mission post in South India, sailing from New York. Carl is principal of a school for children of missionaries and foreign residents at Kodaikanal, South India. — ARKLEY S. RICHARDS, *Secretary*, 26 Parker Street, Newton Center, Mass.

## 1920

A note from Dick Gee indicates that he is still in the refrigerator and oil burner business as the head of Gee and Hawkins in Fall River. — Jim Blodgett is now in Columbus, Ohio, address, 149½ South Ogden Avenue. — Ed Bragg has left Scarsdale, N.Y., and is now in Beverly Hills, Calif. — George I. Brown has left Auburn, Maine, and is in Wabash, Ind. — Jack Nolen is in Washington, address, 1916 S Street, Northwest. — Clyde Norton has also moved to Washington, address 1344 Jefferson Street. — Monroe Shakespeare is still in Kalamazoo, Mich. — Bunk Talcott is in Litchfield, Conn. — Merritt Taylor's new address is Ardmore, Pa. — Bob Van Volkenburgh is at the Naval War College, Newport, R.I.

Scott Carpenter is back in these parts, address, 102 Stoneleigh Road, Watertown. He is with the Waltham Watch Company. — Ken Clark is now a big shot with Johns-Manville and is living at 31 Palmer Street, Scarsdale, N.Y. — Jack Coyle has left Hartford for Bridgeport, Conn., address, 356 Lake Avenue. — Herb Fairbanks is now living at Hastings-on-Hudson, N.Y. — The latest address we have for William Morton Breakey Freeman is Alexandria, Va. — Mike Houghton has turned up on Cedar Lane in Westwood, N.J. — Pierpont Morgan is still way down in Texas, address, P.O. Box 2969, Beaumont. — Ed Van Deusen is in San Marino, Calif., 765 Canterbury Road. — Eric Etherington is back in these parts, address, 15 Highland Avenue, Lexington. — The Wason twins have been shifting about: Elbridge is now living at 21 Allen Avenue, Waban, and Al has left New Jersey for Greensboro, N.C.

It is with regret that I have to announce the passing of Joseph C. Swenarton on August 6 at Washington, D.C. At one time Swenarton was with the City Health Department in Baltimore. — In spite of the cold and forbidding silence that your Secretary has been subjected to, he wishes you all a very happy and successful year. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

## 1921

The chilly blasts howling out of the North as we assemble these notes make us think of a severe winter just 20 years ago — our first one at the Institute. Maybe we shouldn't have mentioned it! Curiosity got the better of us and we looked up that standard work of reference, *The Tech*. Under date of February 1, 1918, the weather bureau is quoted as stating it is the coldest winter on record, but nowhere did the editors describe the pleasure which the freshmen derived from physical torture under the searchlights in the Great Court from four to five those frigid afternoons! Incidentally, that issue tells of the good work of the frosh relay team. Mich Bawden, Larry Conant, Harry Junod, the late Carol Stone, Ollie Bards, Palmer Scott, and Marsh Pridmore were the bulwark of that aggregation. Clark Greene and Bill Young were capturing swimming honors. Technology was welcoming a junior freshman class from 107 applicants, later to be merged with 1921. Reg Smithwick, Russ Steininger, Morris Bauer, Chick Kurth, Zam Giddens, Harty Flemming, Bob Lawthers, and your Scribe were alternating as night editors on the *Transcript's* only rival, and Ray St. Laurent was in charge of advertising. But enough of these reminiscences — or will any of our readers be so rash as to write and ask that we repeat this backward glance every now and then?

We've been conventioning. Result: Met Henry M. Lane at the shindig of the Society of Motion Picture Engineers at the Hotel Pennsylvania. Hank is well known to New England radio enthusiasts as the radio editor of the Boston *Post*. He represents the Presto Recording Corporation, manufacturers of all kinds of sound equipment, and is a 16-millimeter movie expert of the first order. Anyone in the vicinity of 350 Lake Street, Belmont, will find it well worth while to barge in for a real show. — At the Chemical Industries Exposition, Grand Central Palace, considerable attention was focused on the excellent exhibits of the Nash Engineering Company of South Norwalk, Conn., and the Hydraulic Press Manufacturing Company of Mount Gilead, Ohio. Dan Harvey, sales manager of the former organization and 1921 reunion manager extraordinary, was there with the manager of Nash's industrial division, Wilfrid Thomson of Clayt Grover's 1922 flock. Howard F. MacMillin, Vice-President of H-P-M, was so busy with orders for his gigantic presses that we couldn't go into a huddle with him and get the latest from the Buckeye State.

Via the *Transcript* of November 13, we learn that Mrs. Edwin C. Hopkins of Greenfield, N.H., announced the engagement of her daughter, Ella Lavina Hopkins, to Charles Lundy Pool, son of Mr. and Mrs. Walter C. Pool of Wethersfield, Conn. Miss Hopkins was graduated from Cushing Academy and the Julius Harte School of Music and is supervisor of music in Fairhaven and Mattapoisett. Mr. Pool was graduated from the Institute in



1921 Continued

Course XI and from Harvard. He is chief engineer and chemist of the Rhode Island Public Health Commission with headquarters at the State Office Building, Providence, R.I. The wedding date was set for early this year. Best wishes from all of us!

Word has just been received by the Alumni Office of the passing of Jesse Philip Garner at his home in Asheboro, N.C., on February 3, 1936. Jesse was enrolled in Course VI during our junior year, having previously received his B.S. Degree from Guilford in 1917. On behalf of the Class, we extend sincerest sympathy to his family. — It is with regret that we learn of the recent passing of Robert M. Felsenthal's father, and all of us join in sympathy to Bob and his family.

Recent changes of address include: Vernon C. Cole, 543 New London Turnpike, Norwich, Conn.; William A. Collins, 132 Somerset Avenue, Taunton, Mass.; Lawrence E. Harmon, Jr., 619 Lafayette Avenue, Buffalo, N.Y.; Stuart Nixon, 114 West Muskegon, Muskegon, Mich.; Hazen C. Pratt, Central Y.M.C.A., Minneapolis, Minn. — Get on the band wagon and send in your Alumni Fund subscription at once. Remember the Great Court and be as generous as you can — but send in the card whatever you do. Include some news of yourself and earn the undying gratitude of your Secretaries! — **RAYMOND A. ST. LAURENT**, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. **CAROLE A. CLARKE**, *Assistant Secretary*, 10 University Avenue, Chatham, N.J.

## 1923

These notes will appear in print about the time that we get around to announce the second of a series of luncheons or dinners of 1923 men in the Boston area. If you don't get a notice of these meetings but want to come, be sure to notify Howard F. Russell, 185 Franklin Street, Boston. You probably won't get a notice anyway, unless you have been to some of the previous meetings of this group or have specifically asked Howard to keep you posted.

One of the things which, to me anyway, have been unexpectedly pleasant about the meetings is the accounts which those attending give regarding their business or professional activities. The meeting in November brought out that Joseph Fleischer, VI, is developing an exterminating business in Boston, an interesting angle of which is the technique of controlling the important hazard to building structures by reason of termite infestation. Lev V. Goriensky, IV, reported a career which included navy service during the War, architectural design work in connection with the Cathedral of St. John the Divine in New York, the authorship of several books on art and architecture, and, lately, the establishment of a studio in Wellesley Hills. These are only two cases, but they are typical and show the wide range of interests which are pleasantly brought together at these small and informal convocations. Better plan to be at the next one.

Edwin R. Richards, III, is announcing the arrival in his family of a daughter, Ramona Lee, on November 14. The last address I have for Richards is Monterrey, N.L., Mexico. — John W. Ogg, IV, explains a recent removal to New York City: "I left my position with the building bureau of the National Council of the Y.M.C.A. in Chicago, four years ago, eventually going to Washington, where I was engaged in the management of low-rent housing projects under the P.W.A. I resigned from the P.W.A. a year ago to resume my former job with the Y.M.C.A., but this time in the New York Office."

Jonathan Brown, 3d, VI, reports that the first part of last October he became treasurer of Wood, Brown and Wood, Inc., advertising, 209 Washington Street, Boston. His new associates have been in the advertising business for many years. — John A. Frank, IV, reports the new address of 12 East 86th Street, New York City, which he says should last for the next year at least, since he is working for the New York World's Fair. I am not sure that I have recorded here before that he was married in 1934 to Louise Brush of Greenwich, Conn. For more than two years he was employed by the Procurement Division and the Resettlement Administration in Washington. — I regret to report the deaths of James S. Doubleday, XV, on August 22, and Edwin A. Gruessner, I, October 16. Doubleday had been located at Oakdale, N.Y., and Gruessner at Brooklyn.

Among the army and navy men there are some new rankings reported: Major James S. Crawford, formerly captain at Fort Bragg, N.C., now in Boston ordnance district; Lieutenant Colonel James C. Ruddell, formerly captain, Military Science Department, Technology; Lieutenant Commander Wesley M. Hague, formerly lieutenant, Mare Island, Calif., now at Norfolk Navy Yard, Portsmouth, Va.; Lieutenant Commander Richard M. Watt, Jr., formerly lieutenant, Jamaica, L.I., N.Y., now in the Navy Department, Washington.

Let's have your contribution to the Alumni Fund for the new athletic buildings if you haven't already sent it. And to those who have contributed, our thanks for thus giving your class officers a lift in their responsibility for the Class's share in the drive. — **HORATIO L. BOND**, *Secretary*, 18 Jefferson Road, South Braintree, Mass. **JAMES A. PENNYPACKER**, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

## 1924

From Bill Correale comes an interesting account of the dinner held by the Technology Club of New York in December, attended by 15 members of the Class. In addition to Bill, who is extremely busy as deputy commissioner of water, gas, and electricity in Queens, those who attended were as follows: Gordon Harvey, now an engineer with the World's Fair Corporation; Bill Keplinger, who promotes transit pipe for Johns-Manville; Ray Hamilton, whose five children call for hard work at Linde Air Products

Company; Nathan Schooler, doing a flourishing business in metal partitions; Anatole Gruehr, still a mainstay of Consolidated Edison; Jack McCoy, technician for Tide Water Oil; Hood Worthington of the Du Pont organization in Wilmington; Dick Lassiter, again in the construction business; Walt Gress, engineer with the Board of Water Supply of New York City; Frank Hecht of Ebasco Services, Inc.; Henry Zeiger, who has an industrial engineering office at 95 Madison Avenue; Bill Rivers, visiting here from India on a leave of absence; and two financiers, Greg Shea of Lazard Frères and Gordon Billard of J. R. Williston and Company.

Paul Cardinal wrote mentioning the death, a year ago, of Jose Loubriel, formerly with Paul's firm of Hoffmann-La Roche and more lately teaching chemistry at the University of Puerto Rico. — **FRANCIS A. BARRETT**, *General Secretary*, 50 Oliver Street, Boston, Mass.

## 1925

News from classmates in distant countries heads the list this month. It appears that those in foreign lands were more prompt in answering the class letter than a large percentage of you right near home. How about a few words from those of you who have maintained such strict silence for years? From Johannesburg, Transvaal, comes word from our former President, Glen Bateman, and the good word is that he is planning a trip to America sometime during the early spring.

Paul P. Wiant, IV, writes from his headquarters in Foochow, China, saying that that city of a million people was the only one along the coast which had not been bombed up to the time of his writing. The reason for this oversight he doesn't understand, but he is quite satisfied not to have had to dodge bombs. He states that he could write a book of personal adventures which would require no dressing up to be thrilling. Attached to the letter is a story, titled, "The Helpful (?) Military," one of Wiant's recent personal experiences, which reads as follows: "Where duty calls, most missionaries hesitate little or not at all. Acting on this general presumption I planned a recent week-end to be on the island of Hai-tan, 40 miles off the Fukien Coast. My trips over there to look after mission and church buildings are always taken after a session of self-discipline. Rev. H. R. Caldwell and Miss Martha McCutchen of our mission also had business on the windy isle; they do not share my feelings *in toto* with reference to the trip across, though I have often noted that neither of them on pleasure bent makes for the Hai-tan ferry. We understand too that there are 40-odd Japanese warships roaming along the coast; they might get nasty.

"We were scheduled to leave Fu-tsing on Wednesday morning at five-thirty going to the port town of Hai-kau ten miles away to catch the motor junk ferry that was announced to sail at six-thirty. We chartered an old bus for the trip. The

1925 Continued

lady of the party had been invited to supper and to stay the night at the Caldwell manse so that there might be a minimum of confusion and lost motion for the early start. I was already 35 miles from my home in Foochow, also a guest at the Caldwells'. We were having a most delightful supper together, just after darkness had fallen. The plates were being cleared away for dessert when Mr. Caldwell's Chinese secretary came in all breathless, saying, 'The ferry goes to-night; they telephone they would wait if you come immediately.' Well, duty was calling all three; and we don't know yet what was to have been served for dessert. We grabbed our few pieces of baggage, rushed out to the waiting old rattletrap bus, and started off at a mad pace. The road is very rough; the driver was a lineal descendant of Jehu, spiritual if not fleshly. The hard, wood seats of the bus seemed extra hard when dropped down from a foot high bounce.

"When we got to Hai-kau we asked a fellow in the street if the Hai-tan ferry had sailed and he said it had. But you don't always believe all you hear, so we sent the assistant driver of the bus down to the jetty to see. He brought back word that if we hurried, they would wait; they were anchored at the extreme farthest tip of the village, well on to a mile below where a bus could go. So we grabbed our baggage again, got two loafers standing by to help with it, and scurried off down the narrow, rough street just as fast as we could. An armed soldier followed us the last hundred yards; and when we went to put our duffel in a sampan to go out to the junk he insisted on inspecting things. The Diesel engine on the ferry had begun to cough when we were still quite a distance off, so we were most impatient to get aboard. We gave him our calling cards, and Mr. Caldwell showed him a letter from the military magistrate saying that he could travel any place he liked and carry a gun. The fellow then wanted to see the gun! It had not been brought along, as we had planned not to take the time to hunt. He kept on insisting, and I opened my suitcase which had only a perfunctory glance bestowed on it. He said to open the bed-ding rolls.

"All this time the sailors on the ferry were urging us to hurry up; it was anchored only a hundred feet off shore. We started to put our things in the sampan, but the soldier told the sampan boatman he couldn't shove off. During the hottest part of the argument we noticed that the sailors on the ferry were pulling up the anchor; and almost before we realized it our hope of getting to Hai-tan went put-putting down the bay. Three sputtering foreigners were left standing on the barnacled rocks, with feelings in their hearts suggesting homicide."

Pierre Wibaut, VI, writes an interesting letter from his home in Cairo, Egypt, speaking of the pleasant year spent in America while obtaining his master's degree. He is now engineer with the tramways of Cairo and has been on this work since 1928. Some very interesting pictures

were inclosed with this letter which I am sorry cannot be included here. These include snaps of the new barrages now under construction in the vicinity of Cairo for irrigation purposes, and one of his wife and four children taken in his garden at Heliopolis, with a banana tree forming the background.

Hollis Ware provides the following news received in a letter from Frank Preston who is now located in East Haven, Conn. The letter reads as follows: "I hardly know where to begin but guess 1934 will do for a start. In the fall I went down to Luke, Md., for a few weeks with my old friends, West Virginia Pulp and Paper Company, to help out in the drafting room. Luckily for me, enough extra work came along to keep me busy for about nine months. Soon afterward I got a job with the Resettlement Administration, supposedly as map draftsman, although I also ran a road survey, designed dams and swimming pools, and used up yards of adding machine paper. The job was quite exciting, because no one could tell if or when he was going to be laid off, and payday came every now and then, usually about six weeks late.

"For the past two years I've been assistant plant engineer for the New Haven Pulp and Board Company. What with boiler water analysis, and some of the pH, salt, and sulphur tests on boxboard, I've become somewhat of a chemist. At present we are putting in a 135,000 pounds per hour, 400-pound, 650-degree boiler and a 3,500-kilowatt turbogenerator. An interesting point in the turbine installation is that the increase in capacity due to higher steam pressure and the increase in efficiency of turbine and generator allows us to get a 3,500-kilowatt and a 2,000-kilowatt unit in a building built to house two 1,000-kilowatt units. Incidentally the air cooler on the 3,500-kilowatt machine is smaller than the one on the eight-year-old, 2,000-kilowatt generator."

On October 11, Anne Charlotte Ware was born; this makes two girls and a boy for Hollis. — Frank Fricker, XV, also reports the birth of a daughter, Judith Ann, on October 25. He has three other youngsters — Jack, six years; Susan, four; and Danny, two. Frank is still business director of the Ethyl Gasoline Corporation research laboratories in Detroit and finds plenty to keep him busy. — Paul Breer, V, writes from Gloversville, N.Y. Following graduation he worked for two years in Newark, N.J., and then moved to Lynn, Mass., where for ten years he was on both research and plant development work for the A. C. Lawrence Leather Company of Peabody. Last May he obtained his present position with the Ritter Chemical Company of Amsterdam, N.Y. Paul was married in April, 1926, and has a family of three boys — aged nine, seven, and three years. — Harrison Browning, II, writes that he is still at the same old stand, president of The Ohio Gear Company of Cleveland. He took a two weeks' trip to Florida this fall but, as the steel production then fell from 80 per cent to 35 per cent, he thinks

perhaps he had better stay home after this. He says that he finds time to do a little Star sailboat racing but thus far finds another Star, owned by Willard Brown '16, is a little too fast for him.

A few brief notes have reached me through address changes reported to the Alumni Office. Luis Stefani, II, has been made a professor at the College of Agriculture and Mechanical Arts of the University of Puerto Rico. John L. Reynolds, XV, has gone to Raleigh, N.C., his recent abode having been Nashua, N.H. Twitty Whaley, X, is now at the United States Customs Laboratory in Chicago, having just moved to that point from Kansas City, Mo. Milton Salzmann, IX-B, has left New York City and is at present located at the Culmstock Arms Apartment Hotel, Spokane, Wash. Carroll A. Oliver, VI, is now with the Belmont Municipal Electric Light Department of Belmont, Mass., having left the Blackstone Valley Gas and Electric Company of Woonsocket, R.I. George F. O'Brien, I, who has been located in Boston until just recently, is now with the Division of Investigation, P.W.A., in Chicago. Jane M. Dewey, X, is at present in Cambridge, Mass. Until recently she has been associate professor of physics at Bryn Mawr. — A rather belated notice of the death of Emanuel Starr, X, has just reached me. Starr passed away on August 20, 1934. — Lennox F. Rhodes, XII, has returned to Boston after several years in Los Angeles. Our army and navy men are moving about as usual. Lieutenant William F. Twitchell, XIII-A, is at present located in Arlington, Mass., after several years at San Francisco. Lieutenant Commander Albert G. Merrill, XIII-A, has been transferred to the Boston Navy Yard from Washington, D.C., and Captain Jonathan L. Holman, II, who has been stationed at Fort Leavenworth, is now at the Hawaiian Ordnance Depot, Honolulu. — F. LEROY FOSTER, *General Secretary*, Room 6-202, M.I.T., Cambridge, Mass. HOLLIS F. WARE, *Assistant Secretary*, 17 Green Road, Medford, Mass.

## 1926

The Secretary writes on the eve of the New Year, and it is therefore appropriate to begin with three end-of-the-year births. He acknowledges with pleasure a visit from Elton Staples to bring tidings of his third son, Charles Oxnard, born on December 28, and an announcement from Washington, proclaiming the arrival on December 24 of Thornton Washington Owen, junior. Not far ahead of the Staples' and Owens' proud shouts came a bouncing babygram from Mr. and Mrs. Ariel Horle, 6 Brooklands, Bronxville, N.Y., on the birth of a daughter, Judith. Let us welcome Charles, Thornton, and Judith as auguries of a prosperous new year for the Class of '26.

From Pelham Manor, N.Y., comes an announcement of the engagement of Miss Anna Catherine Murray to Mr. Herbert T. Creedon. Creedon is with the New York Telephone Company. — A letter from Edward N. (Bull) Roberts records that he has changed his job and is now



1926 Continued

with the Andes Copper Mining Company, Chañaral, Chile. — John E. McMaster has switched from the Cambridge Electric Light Company to the Plymouth County Gas and Electric Company, Plymouth, Mass. — Duncan A. Crawford is now with Stone and Webster Engineering Corporation in New York. — Stanley P. Sawyer is with the Central Massachusetts Electric Company, Palmer, Mass. — Robert E. Mattson is now a trainmaster for the Northern Pacific Railway Company with headquarters at Pasco, Wash. — Henry W. (Dick) Jones is one of the Institute's Honorary Secretaries in the Philadelphia area. — Karl French is with the Bureau of Construction and Repair, United States Navy, Washington, D.C. — F. P. Romanoff is with the Apollo Metal Works in Chicago.

Joseph Levis, chairman of the 1926 Alumni Fund committee, has received many letters from members of the Class and has turned these over to your Secretary for class records. Accompanying a generous contribution from A. P. Gabrenas was a letter describing his work as a bridge designer for the state of New Jersey. He is living in Trenton and has a son, aged six years. — Charlie Poore and his wife are now running a store under the name of Marjorie Poore's in Bradford, Mass. — Leo Teplow is a lawyer in Milwaukee, Wis. — H. Garcia Capurro is *director técnico* of Compañía Sudamericana de Construcciones in Montevideo, Uruguay. — A. B. Brand is with the Earl M. Cummings Advertising Company, Rockford, Ill.

And now I hope very much that this particular sentence is read by Herb Kaufmann, for he embarrassed your Secretary at the Technology Club of New York dinner on December 9 by genially boasting that his name had appeared in this record of celebrities but one time since 1926. The Secretary is still puzzled as to how Herb ever managed to escape any columnist — particularly this one. He shall, we vow, no longer be a sacred cow and perhaps he shall rue the day that he boasted of his proud position as one untouched by the news mongering of the 1926 Secretary. All of this is but a preamble to giving you the names of the 1926 men who were present at the New York club dinner. A list was kindly supplied to the Secretary by Wick Eddy, who was very much in evidence. Here they are, in addition to Kaufmann and Eddy: Bill Latham, Bernie Morgan, J. G. Walker, F. J. Grueter, Alton S. Heyser, George A. Makaroff, Maurice J. Fish, Dan McGrew. Several of these, like Herbert Kaufmann, have escaped being libeled here for a great many years, and the Secretary hopes in the near future to give more information on dignitaries such as Dan McGrew. — Hump Barry and Ben Richardson of New York stopped in last month, each bringing a ray of sunshine to this secretarial share-cropper.

The Secretary ventures to hope the new year has begun auspiciously for all members of the Class. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

## 1927

Your Secretary has not written on the state of the Class for some months, yet before many of these lines are written he must resort to his personal contacts. The clipping service has given some assistance, but those great potential sources of information — personal letters from you men — are not forthcoming. Once again, I ask for help along this line. Jack Herlihy has recently been appointed superintendent of maintenance and engineering for United Air Lines and will make his headquarters in Chicago. In aviation since graduation, Jack learned to fly in the Navy. He next went with the former Transcontinental Air Transport as chief engineer, where his first job was to lay out the airway from New York to California via Kansas City and Albuquerque. Jack joined United first as a pilot on the Chicago-New York division and then became Eastern division superintendent. No doubt, Jack will be glad to greet any of us who will look for him in the United Lines' office at the Chicago airport.

Nelson Clark was transferred by Minneapolis-Honeywell to the company's headquarters in Minneapolis during the summer, and he is now in the development and research end of the engineering department. Clark reports that he has been married for several years and that he is very enthusiastic in his new appointment. — A clipping from the *Chicago Tribune* reports the engagement of Willard Munro to Miss Martha Jenkins of Hubbard Woods, Chicago, Ill. Miss Jenkins was graduated from Smith in 1935. This news is many months old now but no doubt will be news to some of Munnie's friends. — Your Secretary reports the recent appointment of Maurice Davier as manager of a newly created staff position with Johns-Manville, having to do with forecasting and production coordination. Maurice is living in Plainfield, N.J., and I greatly enjoyed the southern hospitality of the Daviers when I was in New York and New Jersey last August. My visit with them was preceded by two pleasant weeks' vacation in New England, a good bit of which was spent in and around Boston, where I had occasion to see a few of our classmates.

Judas Priest has become the proud father of a red-headed son, and I mean proud and also red-headed. Judas is still with Mason Nielan, where he concentrates mostly on inside sales. — Dyke Arnold has recently built a new home in Newton and continues to furnish AC atomizers to the world at large. — Joe Hammond is now a consulting engineer with Jackson and Moreland in Boston. As you know, Joe has assumed the class responsibility on the alumni committee to raise funds for new recreation buildings at the Institute. I shall take time out from my reportorial duties to ask that the full cooperation of all 1927 men be given to Joe. He has undertaken a difficult task and needs your assistance both in effort when he asks for help and in your willingness to contribute voluntarily just as much as you possibly can to this very

worthy campaign. It is our opportunity to do a small bit in appreciation for what has been done for us in the past.

Ray Leonard, who still remains the dominating influence in the coal business in New England, has undertaken the campaign responsibility for the class members living in metropolitan Boston and, no doubt, has enlisted lieutenants who have obtained many contributions by now. Alf Berle, who is now with United Shoe Company in Boston, is a member of the general Fund Committee. — Your Secretary regrets exceedingly that he must report the death of George Morrill, who passed away on May 20. George, in spite of his infirmity, could always smile from his wheel chair and pass a cheery word. For two or three years, at least, George was connected with the Alumni Association and was particularly concerned with the alumni records. He was engaged in this work at the time of his death. — RAYMOND F. HIBBERT, *General Secretary*, Care of Johns-Manville Corporation, Waukegan, Ill. DWIGHT C. ARNOLD, *Assistant Secretary*, Arnold-Copeland Company, Inc., 222 Summer Street, Boston, Mass.

## 1928

On Christmas Eve when many of you were trimming trees, hiding skis from junior, or wrapping that package bought the last minute, one of our classmates was taking the sacred nuptial vows. I refer to A.A.A., the man who heads all lists of members of good old '28 — commonly known as Archy but who bears the full title of Arnold Adams Archibald, V. Archy's bride is the former Miss Clara West Butler of West Roxbury and Pocasset, Mass., a graduate of Radcliffe in 1931. Archy is now working in Pittsburgh and living at 241 McKee Place, Oakland District, Pittsburgh. Our best wishes!

Among the benedicts of 1938 will be listed Edwin Walton, XVI, whose engagement to Miss Theodora Lyons Morris of New York was announced early in December. Red, until recently, was with Curtiss Aeroplane and Motor Company in Buffalo. He is now technical adviser to the export sales division of Curtiss Wright Corporation in New York.

So far, in the Alumni Fund Drive for providing better recreational facilities, 91 members of our Class have responded. Their response has enabled the Class to enjoy, for the moment, a slight lead over '25, '26, '27, '29, '30, and '31, the Classes fortunate to share the Institute with us while we were at Tech. The lead, however, is very slight and may be wiped out any day unless all of you fellows respond to the call for help. Cy Meagher, as you know, is class chairman, and many other '28 men, such as Bill Murphy in New York, Dick Goble in Chicago, Hennie Dean in Los Angeles, are performing like veterans to keep '28 at the top of the heap. Therefore, if you have not sent your contribution to this worth-while cause by the time you read these notes, please do so pronto. Your contribution will help '28 and, what is more important, will help M.I.T. to realize its long-

1928 Continued

felt needs for adequate recreational facilities. — A happy and prosperous New Year to all of you. — **GEORGE I. CHATFIELD**, *General Secretary*, 5 Alben Street, Winchester, Mass.

## 1929

Though these notes will not be read until the New Year has gotten somewhat of a start, your Secretary would like to take this opportunity of wishing you all a happy and prosperous New Year. We hope too that your Christmas was merry and you each enjoyed the holidays. Other years I have urged the New Year's resolution upon you that you send in that long-sought letter before the year is out. The almost complete absence of results has me in a quandary regarding potent thoughts and sugary words that can be depended upon to draw you out of your shells long enough to drop us a penny post card, at least. If you like to read these notes, think how much the rest of us will enjoy hearing about you. The great majority of us have not seen you or heard of you since June, 1929. Have you moved around like Bill Hutchinson, III, whose many changes of location have required me to fill out a new card for him in our class address file? Even as these notes are being written Bill is moving from Grant Pass, Ore., back to Federal Street in Boston. Such is the life of a mining engineer, but more about that in the following, for Bill's wife, after the custom she originated a few years back, has again contributed the latest on the Hutchinson family activities in the form of a much appreciated letter. Or are you like your Secretary, still working for the same company as you were in 1929?

Now the fine letter from Bill Hutchinson's wife. It follows in its entirety: "Being the only member of the family to divulge any information, I hereby announce the arrival of our second child (also a second boy), David Soule Hutchinson, born, October 17. Hence, we have two prospective future 'inmates' for M.I.T. during the 1950's — or thereabouts. We are still looking for gold — and find it very scarce. However, we find Oregon a most delightful spot, and more particularly this town of Grants Pass — having been here just over a year. — With best regards from us both. . . ."

Congratulations to the Hutchinsons on the arrival of their second child. We are sure M.I.T. will have a place for the two of them in 1950 or thereabouts, and we hope that everyone gets back of the present Alumni Fund Drive so that these boys and those who precede and follow them will have the benefit of the fine facilities anticipated in that project. Many thanks, Mrs. Hutchinson; it is doubly fine to hear from the Hutchinsons on the occasion of the announcement of the birth of your second child.

Last month we received an announcement from Miami, Fla., covering the marriage of Alexis Kononoff, XV, to Miss Frances Elizabeth Gais of that city. The marriage took place in Miami on the ninth of November. Since the announcement was postmarked Miami and Alexis'

address has been Miami for years, it seems likely that they will live in Miami. To them we extend our best wishes for a full and happy married life — and to Alexis, our congratulations.

Your Secretary spent Christmas here in Akron this year, in contrast to the long trek back East of other years. Again we hope that your holiday season was most enjoyable and that Mrs. Hutchinson's letter will inspire other wives to do likewise. — **EARL W. GLEN**, *General Secretary*, Box 178, Fairlawn, Ohio.

## 1932

Your Secretary breaks his silence in these columns with the announcement of his marriage on October 2 to Alice Werner of Rutherford, N.J. After a motor trip to North Carolina we are now living in Bound Brook, N.J., at 47 West Maple Street. This will have to be the reason for temporarily neglecting my duties as your correspondent.

Ours was a great reunion in June, as any of those who were there will tell you. Tom Sears did a very fine job as chairman of the committee, and I wish to express here the thanks of the Class for his untiring and successful efforts. Sunday morning there didn't appear to be much left of the Toy Town Tavern, but, surprisingly, by noon all was in order, except for the minor items of a cot to which I was assigned and two panels in doors. Certainly a hardy bunch, the way all devoured enormous breakfasts after a few hours of sleep, or what passed for it. I know that none of those present will miss the next reunion of '32. How about the rest of you who just couldn't make it resolving to be among those present!

Bunny Nealand, who was Tom's right-hand man at the reunion, is heading the junior membership campaign of the Boston City Club. — Tom Sears was elected a member of the Grand chapter of Theta Chi Fraternity at their convention last September. — From Professor Locke '96 we have news of Jim Demas, who is professor of mining engineering at the Adamson School of Industrial Chemistry and Engineering in Manila. At the time he wrote, he was recovering from malaria and planning for the installation of a small ore dressing laboratory. According to Demas the gold boom in the Philippines is diminishing somewhat. — From China, Arthur Moy Orne [known at home as Arthur Mei] wrote, last summer, that he and his partner were still in Chungking, Szechuan, China, working on the four railroad tunnels. Their biggest difficulty was the securing of supplies from the coast. Much of these had first to come from Germany.

Now we will report the marriages of seven members of the Class: Last August, John Crowther was married to Nancy S. Parent at Poundridge, N.Y. The bride was graduated from the University of California and obtained her master's degree at Columbia. She is now with the New School for Social Research. — Harry Johnson is still with the Unity Feeds, Inc., at 177 Milk Street, Boston. On May 30 he married Marion Martin

and they now live at 306 Harvard Street, Cambridge. — In June, Benjamin Richardson Chadwick married Marion Louise Balmer at Salem, Mass. Gene Lynch married Dorothy Mary Moriarty at Winthrop that same month. The bride was graduated from Simmons College in 1933. Their address is 3144 Sixth Street, Port Arthur, Texas.

John Flatley married Barbara Joan Hall in September at Belmont. The bride was graduated from Emmanuel College with the class of 1933 and has been a teacher of Latin at the West Junior High School in Watertown. John and Barbara now live in Clarendon, Va., where he is associated with the Department of Agriculture, soil conservation service. — Fred Green married Susanna Stevens, September 25, in Rockford, Ill. The bride attended Smith College and the Wheelock School. The couple is now living in Wilton, Conn. — Lounger McLaughlin was married on November 26 to Eleanor Dunning in Boston. His bride is now the director of the Social Museum at Vassar College. She was graduated from Vassar in 1934, received her M.A. in history from Radcliffe in 1936, and the following year studied at Cambridge University and at the Sorbonne. Ed is working for Standard Oil in New York, and the couple is living at Harmon-on-Hudson, which is as close as they could come to splitting the distance between their respective jobs.

John Lawrence figured in the news for last August when his engagement to Janet Beal was announced. Miss Beal attended the University of Chicago and the Chicago Musical College. — John Finnerty was the best man for his brother in September. — Blackie Powell was thoughtful enough to send the following announcement to The Review Office: "A son, Edwin Burnley Powell, 3d, born August 3, to Mr. and Mrs. E. B. Powell, Jr. (the second child)."

In winding up these notes I want to make a strong appeal to every member of this Class to give to the Alumni Fund. This is not a part of an annual call for funds but a drive to give to Tech the facilities for necessary athletic activities. We all remember that the present facilities are extremely inadequate. Can you think of a better way of showing your belief in Technology and its future than in giving freely to this fund? Your fund committee is doing a fine job contacting every man, but they can only set the wheels in motion. You must do the contributing and must help in soliciting others. — **CLARENCE M. CHASE, JR.**, *General Secretary*, 47 West Maple Street, Bound Brook, N.J. **CARROLL L. WILSON**, *Assistant Secretary*, Research Corporation, 137 Newbury Street, Boston, Mass.

## 1934

They say that no news is good news. Well, perhaps it is, but that kind of news does not make very good reading in the class notes section of The Review. The notes for this month might be classed as "Q not Q" — quality not quantity — for although the bits of news that have



1934 Continued

come to my attention may be tasty, there are not enough bits to make a munchable mouthful. This is our column, men, and the way to make it of mutual interest to all of us is for each man to contribute what interesting information he can. Besides supplying news about yourselves, practically all of you are in contact with other members of the Class who are doing things. If you know of other men who are making achievements and hiding their lights under a bushel, we will appreciate your tipping us off.

Bob Moody, who has been working for the General Motors Corporation, export division, since he got out of school, has just been transferred from New York to the Detroit office. — I heard, not long ago, that Bill Beckett is back in harness after spending part of the summer traveling through Europe on a combined business and pleasure trip. Bill is one of the directors of the Beckett Paper Company at Hamilton, Ohio, and is very active in running the mill. He and his charming wife, Fritz, have built a home on one of the hills overlooking Hamilton. Bill has a baby daughter, whom he calls by the endearing term of Moose Face. My, oh my, Bill! What a name for such a sweet child.

Your Secretary is pleased to announce three marriages: first, the marriage of Charles Frederic Barrett, Jr., to Miss Amelia Marian Raspe. Miss Raspe is the daughter of Rev. and Mrs. Otto S. Raspe of Cambridge. The ceremony took place on Saturday, October 2. Mr. and Mrs. Barrett are making their home in New York. Second, the marriage of Earl Keefe Murphy to Miss Sheridan Mason. Miss Mason is the daughter of Mr. and Mrs. Fred Marvin Mason of Oakland, Calif. Mr. and Mrs. Murphy were married on Saturday, the 16th of October. Third, the marriage of David Mitchell Nason to Miss Gertrude Dunham Cooke, which took place on Monday, October 25, at Arlington, Mass. Miss Cooke is the daughter of Mr. and Mrs. Leonard Russell Cooke. Mr. and Mrs. Nason are making their home at 87 West Cedar Street, Boston, Mass.

There are also two engagements which are of interest: Raymond P. Holland, Jr., and Miss Astrid Johnson of Newton Center are making preparations for the final step. The wedding date has not been set. Kenneth L. Dorman and Miss Marian Dowst of Salem have also announced their engagement but have set no wedding date. Ken is working for the Pacific Mills Print Works in Lawrence as research and dyestuffs chemist. — JOHN G. CALLAN, JR., *General Secretary*, 24 Quincy Street, Cambridge, Mass. ROBERT C. BECKER, *Assistant Secretary*, South American Development Company, Apartado 655, Guayaquil, Ecuador, S.A.

## 1935

Before we get into the news, there are three things I'd like to mention: First, the contributions to the Alumni Fund Campaign so far have not been overwhelming. Now that the holiday rush is well over, you'd better sit down, fill out

your pledge card, and send along a check. Secondly, those of you who have already contributed to the fund will recognize, I hope, the size of the task it would be for me to thank each of you individually. Therefore, I'd like to take this opportunity to congratulate you on doing your bit. Thirdly, I suspect that some of you, from time to time, have ideas for improving these notes. Why not drop me a line and give your ideas? I'll do my best to put them into practice. For example, from various sources I have learned that some fellows prefer to have letters quoted in the notes, while others would prefer to have me present the information in my own words. What is your wish, gentlemen (?)? The column is here to serve you, so let's have your ideas and with them the latest news.

Enough of the stray comments. Another crop of ball-and-chain notes: Dick Hughes and Virginia Hill were married on November 26. Bob Forster was best man, and among the ushers were Jack Orchard and Bob Kennedy. Dick and Virginia will live in Hartford; Dick works for the Corbin Screw division of the American Hardware Corporation. Next on the list are Dick Jarrell and Catherine Martin, who are engaged. Dick has left the Spencer Lens Company, temporarily, to study for his doctorate in physics at Tech. — Phil Johnston and Marion Ely have indicated their matrimonial intentions. Phil left the Carrier Corporation some time ago and is now working for the Pulp Products Company of New York. — Fred Kraus wrote to correct an error on my part: Seems that Fred is engaged but as yet holds his head high among the ranks of the bachelors. I reported him, incorrectly, as having married. A public apology to you, Fred. Best wishes to all you lads and lassies.

In case some of you don't read *Life* or *News Week* or the papers, I'll repeat the story of Max Nohl's record-breaking descent into Lake Michigan. Many of you will remember Max's tinkering about the big flume in Building 3 during our little sojourn at the Institute. After leaving school Max continued to develop better diving apparatus and demonstrated its value on December 1 in Lake Michigan, when he went down 420 feet on his second try. Outstanding characteristic of his equipment is the fact that he breathes a mixture of helium and oxygen from a tank strapped to his back. The use of this mixture prevents the bends, which usually results from the absorption of hydrogen by the blood. Max's descent is a new record, the previous mark, set by a navy man, having been 306 feet.

George Bull had the happy thought of jotting down a bit of news on his Christmas card, so we learn that he and Bernie Nelson have completed their training in the cable and line gangs of New York Tel and Tel. They are now doing switchboard and special wiring plan work in offices and factories, with some home installations thrown in for good measure. I don't remember whether or not I men-

tioned it in the last issue, so I'll say here that George became engaged to Helen Curtis last November. Congratulations.

A faithful correspondent, Charlie Smith, provides the information that Dick Smith has joined the electrical division of the Du Pont organization in Wilmington. Lou Garono stopped in to see Charlie during his vacation. In case you have forgotten, Lou is with the ammonia division of Du Pont at their experimental station in Wilmington. Charlie visited the Y in Niagara Falls to see Red Brooks and Mike Kelakos. Mike was working, but Charlie and Red had quite a talk, during the course of which the astounding news slipped out to the effect that Red has turned traitor (heaven forbid) and plans to do graduate work at some Midwestern college, while on leave from his work in Niagara Falls.

Phil Rhodes (the boy with a finger in 20 pies, or with 40 irons in the fire) wrote as follows: "I have read *The Review* as avidly as ever this fall and, not seeing sufficient news of Course VII, I am writing in the hopes that you may publish my appeal for news in the notes. I would like particularly to hear from Tommy Rinaldo and Nix Dangel, as well as the rest of the old gang. Since I saw you last, I have had a variety of amusement, classified as work, but now I have buckled down to the same job I had last winter (installing, demonstrating, and giving instruction in the use of Sargent snow-plows), as well as doing whatever architectural work as comes our way. Last winter I made up all the instruction books, making installation and parts drawings where necessary — which was too often — for the Sargent snowplows. This winter I am doing the same thing, as well as development work on a device which may revolutionize the power-shovel industry." In case some of you have forgotten, Phil is in Portland, Maine, where they get a bit of snow.

Phil's letter continues: "Nights and Sundays I work on the architectural jobs, the principal ones now being a large alteration and modernization program for a local hotel, and numerous store fronts. Incidentally, Eddy Norris '31 is working with us at Maine Steel Company, doing the development engineering on a new earth plow (the Rotoplow). He recently left the C.C.C. in Vermont where he was an officer for a couple of years. For the six summer months I had a cottage at Peaks Island in Casco Bay, and a frequent visitor was Dick Campbell of VI-C, who is an instructor at the University of Kansas. There he has greatly aided the communications courses in operating on a low budget by inventing gadgets which effectively serve in place of expensive equipment they can't buy (or borrow from M.I.T.). At a dinner one evening at which he and some of my high school classmates were present, I concocted a knockout beverage, Peaks Island pop — formula on request. Three drinks and you'll pop anything."

"During the last of the summer and early fall I worked with the sectional representative of the Insulite Company

(Mulehide roofing, and so on), devising a sectional, portable, 10 by 12 overnight cabin, to provide an all-insulated cabin at a price low enough to allow their operation by any property owner. Traveled around the state with him, supervising construction in key spots, answering questions on the technical end. At present we have marketed several, and they will be available for about \$160 in the spring. As I fooled with the cabin, I made a little birdhouse which is insulated (slogan — keep the birds North in the winter), and I'm trying to get an order for 25,000 of them. If I do, I will form my own outfit and manufacture little things that people seem to be crying for. It would just be a side line though. (Are you sure you don't have a certain type of black bird in the belfry, Phil?) In October we celebrated Philip H., the second's, fourth birthday. Thanksgiving my wife came home from the hospital. December 5, I write you. Time marches on!! The letter was signed: "Philip H. Rhodes of: Herbert W. Rhodes, Archt.; Maine Steel, Inc.; Philip H. Rhodes Industries (prospective)." What a man!

Lew Simon sent me a note to say that they are busy in Detroit getting out the 1939 models of the General Motors line and are plenty busy. They have settled down to a schedule of three nights a week, working until nine o'clock and Saturdays until four, though they never can be sure when they will have to put in even more time. Lew says that if any of the fellows there had the impertinence to wish to lead a life of his own, such as starting a continued story in the *Past*, he would have to get special permission from the boss for time off. Lew saw Bruce and Bill Bagley but had no news about them to offer; guess the evening was a bit too damp for a memory to operate. Lew says that within a couple of months he will either "1. have the same job; 2. have the boss's job; 3. be fired." We hope for Lew's sake that Number 2 turns out to be right.

Karl Achterkirchen added his bit to the news this month: Reported that George Agnew got married last spring down in Pennsylvania and that Clay Smith married just before going out to Ohio to work for Waco Aircraft. (How about sending in the details, George and Clay?) Karl also mentioned that Bob Goodman is back in Boston, teaching at the airport and at Boston University; Mort Rosenbaum is still with Consolidated Aircraft and plans to get married this month; Les Moffat is also at Consolidated. Karl added that McDonald is working for B. F. Sturtevant Company in Boston (heating, ventilating, air conditioning, power-plant fans, and so on) but omitted to mention which of the two McDonalds in the Class he means. My guess is that Johnny McDonald is the fair-haired lad. Right? As previously mentioned in these columns, Karl was married last June, on Long Island. After the wedding Karl and Mrs. Achterkirchen drove to Washington, D.C., and then out to San Diego, where Karl is working for Consolidated Aircraft Company.

A short note from Carl Floe reminds us that he is still teaching metallurgy at Notre Dame and liking it. He says: "We really have an engineering school, as well as a football team." Carl and Peg (Proctor) spent the summer traveling by automobile around the northern countries of Europe. — The growing Christmas spirit moved Dick Whitmore to help a friend by writing in a bit of news. He reports that Al Creighton is still with Waukesha Motors and doing nicely, and that his chief diversion is a Swallow biplane which he acquired in October. Al has soloed (or had at the time of the writing) four hours and expects to make a couple of trips East during 1938. Dick further reports that Don Wood expects to be a proud father early this month. Dick himself has been with Westinghouse X-Ray for a year, as sales representative in north New Jersey. He bewails the fact that it would be a lot easier to sell X-Ray on an engineering basis but that most doctors refuse to give much consideration to efficiency of design or operation. Consequently, they tend to follow the ballyhoo type of argument, be it that of friend or salesman. (Can't a salesman be a friend?) Result — Dick is forced to ballyhoo his wares about the country — quite a come down from good old Tech, where such stuff was not worth the inventive effort — or was it? Dick goes so far as to suggest that a course in ballyhoo be offered at school. Guess Dick never heard of that famous Course XV. However, we have to give due credit, for it's surprising how far engineering goes when mixed with a little ballyhoo.

Pat Patitz sent quite a lengthy epistle last month. Here's the low-down. Since last writing Pat has continued to be engaged in the business of starting-up, servicing, and testing power boilers and certain pulverized-coal equipment. His status is that of service engineer with the Foster-Wheeler Corporation, and he travels over part of the country in his car, without the least sign of a definite schedule. From Rochester, which is where he was when last heard from, Pat's work took him to St. Catharine's, Ontario, Canada, at which place he was occupied over the greater part of a year in a new plant housing three new boilers, air heaters, and six pulverizing units. Considerable development work was done on the latter. Pat's stay at St. Catharine's was broken by business trips to New York City and a short job in Oil City, Pa., where Christmas Eve and New Year's Eve, 1936-1937, he had to fire a new boiler and keep it fired to ensure the lighting of the Christmas trees in the homes of the folks at the foot of the Alleghenies. Pat mentioned that the service engineer's life is not only free and easy (?), but that one is, like a doctor, subject to call at any time of the day or night in case of trouble during starting-up periods, or until wrinkles and bugs are ironed out of new plants. From early January, 1937, until the middle of the summer, Pat's time was divided between the job at St. Catharine's, another in

Rochester, one in Warren, Pa., and a few trips to New York City. After a well-earned vacation in August and a few days in the New Jersey offices, he made a hurried trip to Cincinnati, where he was busy for a week testing a new boiler. He made the trip with a single sitting in the wheelhouse, each way, and does not recommend it to anyone.

After a week of night-shift work in Philadelphia and a return to New York, he hustled back to St. Catharine's. Besides the previously mentioned job there, Foster-Wheeler also have a plant and offices. These are tied in with a new plant located in Quebec, 450 miles north-east of Quebec City and on the St. Lawrence. Pat says that the nearest railroad is 125 miles away, so I assume they do all their shipping by water. On returning to the New Jersey offices, he had a few calls to make on Staten Island, followed by a trip down into the hill-billy mountain region of the southeast corner of West Virginia, in the town of Logan. Pat says that in Logan there is a little teakettle capable of producing 1,350,000 pounds of steam per hour at 1,400 pounds per square inch pressure. The units are fired by pulverized coal — perhaps you've heard about it. Pat left Logan during the latter part of October to help start a new plant in Louisville, Ky., which also has pulverized-coal equipment. He was in Louisville at the time that he wrote. Seems that circumstances made it necessary to subject the Louisville boilers to an elaborate and rigid program of boiling-out in order to clean them thoroughly before putting the plant into operation. Consequently, they had to stay on the job day and night from Tuesday morning to Saturday noon. Pat says that besides firing the boiler intermittently and performing the other necessary operations, an important pastime was that of patronizing a local purveyor of good coffee. His stay in Louisville is as definite as it might be in any other place, but he enjoys what he calls "this friendliest of friendly towns" and would consider it a real pleasure if a classmate should suddenly appear in the Blue Grass Room of the Brown Hotel. He maintains that one of Joe's (the bartender) eggnogs would be just the thing to start a good bull session. Pat is so enthusiastic about this fine concoction that he sent in the recipe: "Data: crushed ice, tall glass, one egg, a couple of jiggers of rich cream, one jigger of Kentucky bourbon, one pony of rum, one pony of brandy, and then, brother, shake! Serve in tall glass without ice, add sugar to suit, and sprinkle with nutmeg. Dependent upon whether or not one has on his drinking togs is the number of these social catalysts that one can consume gentlemanly." It sounded so good, and so potent, I thought you fellows might be interested. Don't blow the roof off the happy home, though. This certainly has been a complete and interesting story of your experiences, Pat. I hope that your fine example will not fall unheeded by certain members of the Class (practically all) who think they are too busy to dash



## 1935 Continued

off a good informative letter now and then. You guys better try a few of those "social catalysts" and then let us have the news.

Barney Freiberg is the next news column loyalist to provide a bit of news. At the time of writing, Barney was working for Cushman and Wakefield, Inc., real estate and insurance. He says that he has had six addresses in New York City in the last year and not because it is cheaper to move. We can only guess at the reasons for this gypsy attitude on the part of Barney. He mentioned having seen Larry Stein, Tuffy Emery, Bill Yepsen, Bill Thompson, John Westfall, Al Rogowski, Don Taylor, and Al Frank, as well as his own brother. Barney says that everyone in his neck of the woods seems to be happy and contented, although grumbling at the excessive big-town prices for food, rent . . . and the excessively low prices for talented, trained labor. I suppose the latter applies to the above-mentioned classmates.

Here's a bit of news from Wes Loomis: "Things here in Kansas City keep me pretty much tied to home. However, Jim Grove from St. Louis was here last week (November) and we are planning to go to St. Louis to see him. I was in New York for a brief period around the first of September and saw Phil Johnston, Charley Taylor, Pete Grant, and Bill Yepsen. Taylor is harder to see than F.D.R. and I practically had to knock down a reception girl, an office boy, and Taylor's stooge to get into his office. He has a swell job and I think holds the title of assistant purchasing agent. (Wes did not mention the name of Taylor's company, but I think it is the Riegel Paper Company.) Johnston is with the Pulp Products Company and for all I know is chief engineer. He looks great and likes his work. Johnny Duff and I managed to meet in Taunton, of all places, for a quick drink while I was in Duxbury with Mrs. Loomis over Labor Day. . . . Bemis stopped here last summer on his way East and threatens never to visit this place again. He is now convinced that we were laying for him, but if he had only told us that he had not had his dinner, I can assure you that he would not have felt half so badly the following day. However, he can still take it. That just about covers everyone that I have seen and more than covers Bemis, Taylor, and What Duff." Oh my — what trials and tribulations beset this world of ours!

Many thanks to all you fellows for the fine crop of news this week. Let's hope the coming year will see bigger and better class notes. There's a resolution for you — at least two letters to your Secretary during the year. — ROBERT J. GRANBERG, *General Secretary*, McCulloch B-13, Soldiers Field, Boston, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

## 1936

*Course I.* A half day spent at Technology recently was rewarded by a chance meeting with Frank Berman in one of the dark

corridors. Frank is doing graduate work, specializing in structures, and plans to get a master's degree in June. He seems to be keeping better track of our Course than I am, as he was able to inform me about three of the group. Al Bagnulo and Norm White are with the regular Army at Fort Du Pont, Del. Dan Burns, too, is a long way from home; he is selling insurance in Texas. I understand he is working for the Liberty Mutual Insurance Company of Chicago.

*Course II.* We have a bit of news about Francis Peterson, whose marriage to Winifred Clark of Wellesley College was described here last month. One of his fellow workers at the Texas Company's research laboratories in Beacon, N.Y., was visiting here recently and says that Pete is a "big antiknock man" for the company. Moreover, I pass on to any hungry bachelors who happen to find themselves near Fishkill, his comment that Mrs. Sherman serves a very fine dinner. Pete went hunting in the Adirondacks in November and came back with two deer to fill the family larder.

*Course III.* Through the office of Charlie Locke '96, Alumni Secretary, the following information has found its way to this column: A letter from John P. Hayes in the early part of November reported that he had been working for a month as a part-time sampler in the mines of the Anaconda Copper Company at Butte, Mont., and the remainder of the time he was on the repair gang underground. Charlie Price had also been doing the same thing, but he thought the field looked greener elsewhere and had left for Climax, Colo., to work with the Molybdenum Company. At the time Hayes wrote, the Butte mines were curtailing, and since he had been only recently employed, it looked as if he might find himself out of a job before long, in which case he was planning to visit other Western mining camps in search of a job.

*Course VI-A.* The rumor of Norm Willcox' marriage on November 20 has been confirmed. The bride was Miss Marjorie Vander Eb of West Hartford, Conn., and the ceremony took place in the First Congregational Church of Old Saybrook. Our congratulations to this couple. Norm has written to the *VI-A News* that he and B. S. Maximoff have been accepted for the advanced course in engineering at Schenectady, commonly known as the "A" course. The course is given for men of ability, and admittance is highly competitive; this year only 30 of the 130 taking the examination were retained. The *News* reports further that A. Ordas has been transferred from Schenectady to the induction motor department and the Oakland works of General Electric, where he expects to stay for about two years. O. B. Falls, Jr., is working in the power transformer section of the Central Station Department in Pittsfield. "Recently Obie sent an announcement of the birth of his daughter; the announcement consisted of one of the pretty cards giving the baby's name and weight. According to the announcement the baby weighed 6' 10". Quite a baby!"

*Course VII.* Riding the same train between Boston and Springfield as I, was Stan Freedman a short while ago. Stan was returning from a vacation at home to Massachusetts State College, where he is taking graduate work in connection with dairy practice. During the past year he had been working in a dairy concern and enjoyed the work so much that he determined to study the subject further.

*Course X.* Because most of his friends are members of our Class, Gerry Chapman, who received his master's degree this past year, has changed his affiliation to our Class. Gerry is working for Skinner and Sherman, Inc., of Boston. — George Putnam is working for the Texas Company in Lockport, Ill.

*Course XIII.* Art Wells certainly seems to keep well in touch with the members of his course as evidenced by the following letter: "A card from Ed Rowe at Newport News tells of the marriage of Gordon Donnan to Carolyn Bunker in Wollaston, Mass., at Thanksgiving time. Gordon is connected with the Newport News Shipbuilding and Drydock Company, as also is Ed. In his card, Ed hints that a local Tech club is in the making down there, and that Johnny Graham is the man behind the plans. Bob Wead has recently changed his business address. He is now in the engineering department of the United Fruit Company's Boston branch, and he sounds very enthusiastic about the work and the prospects. Bob is still living at 474 Brookline Avenue, Boston. A letter from Dave Cooper reveals that he and his wife and their son Jimmy are thriving on life down East. Dave is employed at the Bath Iron Works and is living at 119 North Street in Bath. . . . I was rather surprised a few weeks ago to find that a certain chap all primed to fire a sales talk at my boss was Bob Johnson. He is now with International Nickel Company, and he and his wife are living in New York City. Bob is enjoying his work and can tell you plenty about the use of bronze in steamship machinery. Harry Scheel who, after leaving Technology, sailed for Europe and spent a year or so designing for a German yacht architect, is now back in this country designing on his own. Although his headquarters are in Provincetown, Mass., at 215 Commercial Street, he has a New York City business address at 233 Broadway. His connections in Europe are apparently still quite alive, for his letterhead includes the following clause: 'Correspondents in Sweden, Finland, and Germany. New York cable address — Scheelabme.' No this isn't a paid advertisement, but I thought it would interest you as much as it did me. Bob Woodcock and I recently had a short chat with Harry. That same evening Harry caught a train for Ohio — business in connection with some yacht he had designed or was going to design. He is working for himself, and seems to be keeping himself pretty busy. Harry informed me that Frank Simonds is now port engineer for the Standard Oil Company in Philadelphia. Frank's address is 2202 South Broad Street in Philadelphia. Al Gray is still living in Chester, Pa., his

1936 Continued

address now being 968 East 20th Street. He says that they are keeping him pretty busy at Sun Shipbuilding, and . . . it looks as if they were turning those tankers out like hot dogs."

After such a complete letter, one wouldn't expect there could be any more news about the Course, but we do have two additional items: First, Milton Brooks is in the industrial planning division of the United States Navy Department in Brooklyn, N.Y. Also, we have the announcement of the engagement of Maro F. Hammond to Miss Mary M. Freshman. After leaving Technology in his freshman year, Hammond attended the Vesper George School of Art, where he met his fiancée.

*Course XV.* By way of a Christmas greeting, Harry Essley wrote a brief note to say he is still with Reliance Electric and Engineering in Cleveland. So you thought that little news wouldn't appear in The Review, Harry! Well, now you see to what depths a correspondent must sink when the pickings are slim! — Hawthorne N. Brown is now with the Western Electric Company in Baltimore, Md.

*Course XVI.* "Here is what news I've been able to gather from here and there," says Bus Schliemann, who has changed his address to 112 Central Avenue in East Hartford, Conn.: "Yank Spaulding writes that he is hard at work for Pan American Airways, and is residing in Coconut Grove, Fla. He now has the title of maintenance personnel instructor. But in his own words his work 'runs from stress analysis and flight testing to training and organizing the flight mechanics.' . . . Yank sends word that Dan Pearson is now in Alameda, Calif., flying on the Pacific route over to Manila and Hongkong. Seems as if Dan could write in a mighty interesting letter if he would. How about it, Dan? (Schliemann's address is given above just for your benefit!) Bob Lutz and Dick Kogler are doing stress analysis out at Consolidated, and I guess they are working night and day, since they don't seem to have time to send any news. Dutch Achterkirchen '35, Professor Newell's exstooje, is also out at Consolidated. Dutch joined the ranks of the married men last spring. Congratulations, Dutch, and good luck. Lombardi sends word from Martin down in Baltimore, where he is working in the engineering department, in the new building which is 'air conditioned, sound proofed, and has Venetian blinds on the windows.' He also writes that two of our renegades from the field of aeronautics, Web Francis and George Trimble, have returned to the ranks of the intelligentsia and are now also down at Martin, Web in his fourth week and George in his third. They have promised to write, so next letter should give the why and wherefore of their change of vocation. Harold Miller, too, is down at Martin and is two-thirds through the six months' training course.

"Jack Chapper has added another company to his list and is now with Porterfield in Kansas City, where he went after Sikorsky. He is, as far as we know, the first one of our Class to get into the

strictly commercial, sport-plane class. . . . Ed Dashefsky has also left Sikorsky and is now with Curtiss in St. Louis. They have always managed to stay pretty close together. Or aren't Kansas City and St. Louis very close? Dick Murrow, I believe, is with Lockheed out in Burbank, Calif. And Dave Gildea is with a building construction company in Philadelphia, where he is doing some chem engineering, according to some dope I have from Dorian Shainin. Shainin is still with Hamilton Standard in East Hartford. . . . Jack Hamilton and I are still with Chance-Vought. Hen Runkle is the only one of our Class left at Sikorsky, and we hope to have more news of him next time. For those of you who do not know it, the Institute is starting work on the new wind tunnel in back of Building 33. It should be finished in a year or so . . . the last word in wind tunnels." In his postscript, Bus says that he just missed seeing Charlie Endweiss while he was up in New England on his 30 days' leave. Bus says he has a permanent post in the Naval Air Corps now, but I understand he is with the United States Marines at Quantico, Va. He is in "Aircraft One FMF," whatever that is!

*Course XVIII.* One of the penalties for anyone studying mathematics is that news from this Course always appears at the end of the column. The mathematicians must have become tired of always being last because now there is a Course XIX at the Institute, but they're still last (in numerical order only) among the Class of 1936! Eli Grossman's calculation of mortality tables for China with the United States Life Insurance Company seems to have made him quite a student of the country. He writes: "By this time I have learned to say and write a few words in Chinese (Cantonese). In fact, I can now use an abacus to calculate. One of my Chinese friends took me to see a Chinese musical-comedy talkie picture produced in Hongkong. The comedian walked like Charlie Chaplin and had a little mustache. In fact, his humor was very much like Mr. Chaplin's. The Mae West of the Orient was quite attractive in this picture, and some of the songs were very enjoyable. Not long ago I met Philip Di Salvatore in Newark while he was coming home from Princeton for the evening. He is now a research assistant in mathematics at the graduate school of Princeton University. No longer working in the field of geometry, he is majoring in statistics. Elmer Davis wrote to me and is still enjoying his work at the Columbian National Life Insurance Company. He bought a new Ford recently, so he must be doing well." — In conclusion, I remind our readers that the addresses printed below are waiting for letters. — ANTON E. HITTL, *General Secretary*, 100 Highland Avenue, Buffalo, N.Y. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3-210, M.I.T., Cambridge, Mass.

## 1937

We'll start off this month with a bit of Winchellizing, in the form of a few engagements and marriages. I noticed in

the Boston *Herald* of November 14 that Mr. and Mrs. Arthur C. Davis of Beverly Farms announced the engagement of their daughter, Miss Barbara Congdon, to R. Spencer Rutherford, son of Dr. and Mrs. Thomas A. Rutherford of Clarks Summit, Pa. Miss Congdon is a graduate of Burdett College. Mr. Rutherford is a graduate of New York Military Academy and the M.I.T., where he was a member of Theta Xi. I also noticed that Mr. and Mrs. Prescott C. Crafts announced the engagement of their daughter, Phyllis Genevieve, to Raymond Herbert McFee, who is back at the Institute doing graduate work.

Goodwin deRaismes writes from 5538 Cornell Avenue, Chicago: "Here's a little news for Winchell's column: Joe Heal, who, with Ahmadjian, is working in Hammond, Ind., has disposed of all his jewelry, bought some additional, and set the wedding for January. For further details I'd advise that you get in touch with Joe or, possibly better, Ahmadjian. Dexter Gaston is working out in Rockford, Ill., about 85 miles west of here. Bob Jordan is living at home in northern Chicago and is working out at the Crane Valve Company."

In contrast, Joe himself blithely runs over anything of that nature when he writes from 18333 Chicago Avenue, Lansing, Ill.: "The address above will probably be permanent for some time to come. I should appreciate it very much if I could get a copy of the November issue of The Review as I'm getting very hungry for news from school. For purposes of the records I might add that for the past four months I have been working as a special apprentice for the American Steel Foundries Company of Hammond, Ind." — All the way from Port Arthur, Texas (2620 Procter Street), Dick Karch frankly admits that he expects "to go the way of all flesh and get married before long." He mentions a Sue, but Sue who? I'm sure I don't know!

As for marriages, already there are several. The first seems to be Bob Winans, who, in a very prosaic manner, in a letter from 37-28 86th Street, Jackson Heights, N.Y., says: "As a bit of news on Alumni, I am with the Bell Telephone Laboratories, Inc., working in the vacuum tube development department. I was married to Julia Bockee of Amenia, N.Y., on September 18." Other marriages are those of Miss Catherine Graham Smith and Newman V. Gates, October 1; Miss Lois Swenson of Concord, N.H., to Frank L. Moore, Jr., October 2; Miss Claudia Severance Bassett of Newton Highlands, to Tom Kinraide, October 23; Miss Helen Charlotte Richards, Maplewood, N.J., to Kenneth B. Gair, on December 24.

Louis Bloom, X, from 1102 East Rittenhouse Street, Philadelphia, Pa., has come through with a very fine letter, giving us the low-down on how to get a job and on some of our more worthy classmates. His preamble strikes a familiar note: "Your short plea in The Review stirred my rather inert 'class' consciousness, and I fairly flew to my trusty typewriter. At this point, I am not



1937 Continued.

sure just what part of this you really want to hear, so I am trusting to your delicate taste to prepare it for the discriminating reader." From there he launches into the real reason for his writing: "The six months since graduation have passed with more speed than any period in my life. My perspective has changed accordingly; no longer do I think of days, weeks, and months, but years. However, no story being complete unless it has a beginning and an ending, I'll stop rambling and give you the beginning. All my prospects for permanent employment after that most memorable of days, June 8, 1937, collapsed, somewhat akin to its sister collapses of the stock market. But with a stroke of luck I managed to obtain a summer job with the Sun Oil Company in Marcus Hook, Pa., in the development department. This enabled me to get experience, look for a permanent position, and get paid; thus making me a three-in-one engineer. It also had rare possibilities of providing a permanent job in itself. I traveled a total of 52 miles a day, learned a lot, and had a grand time. My job-hunting activities comprised writing 26 letters to oil companies and getting 25 answers, out of which there were two prospects for jobs besides innumerable courtesies of being kept on file. Net result: a self-award for industrious letter writing, but no job. And then instead of the dawn, came the fall, namely, the 15th of September, when I drew my last payment for services from the company who keeps your motors young. It is drawing nigh onto three months now of constant plugging for work. I have contacted about 60 of the biggest oil and engineering companies in the country, and they are either kidding me or waiting for business to improve. With the feeling more of curiosity rather than despair I have tried every conceivable angle, ranging from bluffing my way into an executive sales engineering job, engineering opportunities, lab jobs, sales, vocational teaching, floor-walker in a department store, baker, typist, steel worker, employment agencies, and even pleading for a laborer's job. They are laying off laborers; employment agencies are rackets; I am too young looking for sales work; I haven't enough experience for the engineering jobs I have uncovered or I am the wrong kind of engineer; you have to wear lipstick and roll your stockings for typing; and I can't teach for lack of educational subjects.

"Thus, the longer I am out, the more I condense my ideas and find out what I really want to do. After a while of a long time, I am certain that I want to do design and development work of industrial equipment, for which I am too young and inexperienced. Dad has promised to support me for another year provided that I can obtain the tuition for a graduate year, either through work or scholarship. . . . My next aim, then, is the Practice School of Chemical Engineering. I could kick myself every time I think that I could have been five months on the way, if I had been farsighted and had a

little of the common sense I am accumulating day by day. I intend to go up to Tech the week of the sixth for a combined 'pleasure' and business trip to launch my plans for the 'future.' Incidentally, I spend my time here in Philly doing all that reading that Tech fellows are supposed to be deficient in. I average a book a day, plus several newspapers daily, and all the printed matter that penetrates the household, and not being able to afford a secretary I carry on my siege of industry personally. If I were being paid, I could call myself an executive, as I am rapidly forming a corporation.

"Having dispensed with myself, I'll try to rack my memory for any glimpses of our brethren. Irwin Sagalyn, X, is working for Gulf Oil Corporation in Philly, taking a night course at Drexel, and sporting a '37 Dodge coupé. I saw Marcy, X, walking on Chestnut Street the day of the Army-Navy game. He is working for Franklin Sugar, I believe. Ed Lynn, X, was also seen in Philadelphia during the summer. Bob Fischel and Pitkin of Course XVI are pleasantly situated in Burbank, Calif., in a small house which they have rented. Bob has a new car and has been advanced off the board out into the plant. I think their company is Lockheed. Until recently they worked about 14 hours a week overtime.

"Windy, I hope you are enjoying life in general, and I hope your job as secretary does not pall you too much, because we are all inherently a lazy bunch. Don't thank me for this letter, because time is the only thing of which I have plenty. The folks at home compare me to a polar bear, except that they sadly lament that at least a bear comes out of hibernation in the summer while I enjoy its advantages all year 'round.' — Very fine, Louis, very fine! You surely got down to the point in language that makes us realize that you really mean it, although there may be some of us who envy, somewhat, your abundance of time.

Continuing in Goodwin deRaimes' letter, I find that he has been quite active in Technology affairs, but let's let him tell it: "I've just put down The Review, in which I notice that my brother made the class notes, thanks to Vic Kron's letter. I think that '37 ought to be a little ashamed of itself for its representation in The Review so far this year, but it has only itself to blame. Last Tuesday night I attended the banquet given by the Technology Club of Chicago, at which time I saw quite a number of the fellows that I had formerly known at Tech, but again '37 was rather poorly represented. There is one thing that is quite definitely fixed in my mind, and that is that those who fail to take the opportunities offered by the respective Technology clubs throughout the country are only cutting their own throats. The banquet was well attended, the affair well organized, and President Compton gave a fine outline of what the Corporation and administration at Technology are striving to do for a better Tech.

"As for myself, I'm working for the manufacturers of one-half of those tin cans so ably described by Mr. Burchard [23] in his article in the December Review. I've been working with the American Can Company since the first of September, when I came out here to Chicago. It's rather difficult to describe my position with the company just at present, except to say that I'm classed as a special inspector and that I'm doing special report work for the assistant superintendent. The company has been perfectly wonderful in the way that they have been treating me, giving me every opportunity that a person could ask for to grasp the fundamentals of the business. It is really a fascinating industry, as Mr. Burchard mentions, but it's utterly impossible to comprehend how truly fascinating it can be until you've actually seen a factory in action, have seen cans being manufactured at 300 per minute from a single machine, and have heard the constant din of cans being made and conveyed through the plant. I'm hoping that some of this information will be helpful in preparing next month's notes and that others may respond at the sight of other classmates' names in print." — You aren't hoping any more than I am, Goodwin! The letters that have come in so far have been very good indeed, but they are woefully lacking in numbers, woefully! I can't understand it; perhaps it is as Dick Karch says at the end of his letter: "Drop me a line and tell me how the fellows are doing. It is too far for most of them to write." But doesn't Jim Farley's Pony Express cover the whole United States and its possessions? Why I have seen post cards with so much on them that if Jim ever saw them he'd turn over in his swivel chair.

Continuing with Dick's letter: "When I arrived here [Port Arthur, Texas] in June, I was put to work as an efficiency expert and time-study engineer. In the middle of last month I was transferred to the welding department as an assistant welding engineer. My duties at present consist of testing all the welders and just lately doing all the chrome-moly heat treating. It surely keeps me busy; I have to schedule about 50 men every day and have four men under me who do nothing but inspect the welders. Also got me a rather sizable raise but it worries me in that I have that much more to pay income tax on." You're lucky, Dick, to have an income to pay a tax on! I notice also that he has a Jolloppey — "and of all the pieces of junk I have ever had, this is the prize. I spend most of my time hoping I get to work before it busts something new. Port Arthur is surely one . . . of a place to live in. It is 50 miles from nowhere and when you get to nowhere there is nothing doing there."

Al Reinhardt has sent me one of the most newsy letters to date. It is so complete I won't attempt to edit it in any way, but give it to you as it was written: "The news from the Class of '37, as it appeared in the December issue of The Review, is sadly lacking in information, and seems to indicate that members of

1937 *Continued*

our Class don't care a hoot who knows where they are or what they are doing. It being thus, I have taken it upon myself to give you a little info on a few fellows, in the hope that it will stimulate others into writing a short history of their activities since they left the Institute.

"To begin with, I gave our erstwhile personality man, Gustav Richard Young (who is messing around in Course XV for an S.M. Degree, along with Ed Brittenham), a number of tips on the whereabouts of several '37 men, but I surmise that his 'professional duties' as money getter for the Alumni Drive have kept him so busy that he didn't think of writing to you. . . .

"Archie Ahmadjian, XV, and Josiah Heal, XV (rumors have it that the latter will be married soon) (Secretary's note: What, again!) are working in Hammond, Ind., for American Steel Foundries, and Archie has written several interesting missives describing his work, the town — and women; ah, yes — women!" Whoa, Al! "Robert S. Reichart, XV, is with the Goodyear Tire and Rubber Company in Akron, Ohio; C. Olson Pike, IX-B, is also working for the same company, along with Howard Cousins, II. Kerry Arabian, X, is located in California with a large oil company. Ed Bartholomew, II, and Charlie Dierksmier, II, are both working for the American Steel and Wire Company in Worcester, Mass. Miss Frances Blackwood, V, evidently lured by things other than scientific, is seen around the Institute quite frequently. Phil Bliss, VI-C, bumped into me the other day at the Coop, and said he was working for a signal outfit in Newton, Mass. I met Duane Wood, VI-C, at an E.S.N.E. meeting recently and he seems to be enjoying his work at the Hygrade Sylvania Corporation in Salem, Mass. Charlie Cardani, Dick Fowler, and Sam Noodleman, all Course VI men, are identified with Delco Products Company in Dayton, Ohio. Johnny Hanlon, II, and Nic Cestoni, V, are working in Malden, Mass., for a fuel research outfit. Tom Kieley, XV, is helping to straighten

out the Alumni Office at M.I.T. Max Gerson, II, is located in Newark, N.J., with the Carbondale division of Worthington Pump. He has visited me twice and on both occasions expressed the desire to be back at Tech. — I wonder how many other fellows are suffering from Techitis. Raymond McFee, VIII, and Mortimer Nickerson, V, are both doing graduate work at the Institute, the latter pursuing studies leading to a Ph.D. Gil Mott dropped in on me the day of the Harvard-Army game; he is working for the Bridgeport Brass Company in his home town, Bridgeport, Conn., and informed me that his younger brother is enrolled as a freshman at our Alma Mater. Ed Peterson, II, is doing graduate work at Harvard Business School, evidently not caring to be discriminative in his choice of a girl's school.

"Milton Karr, XIII, was appointed to the staff of the Naval Architecture Department here at Technology, and he very kindly submitted the following list of names and addresses of Course XIII men: Roy W. Smith, Federal Shipbuilding and Dry Dock Company, Kearny, N.J.; Charles R. Gidley, Jr., George T. Rundlet, Frank J. Mather, 3d, and H. Dudley Swain, United Dry Docks, Inc., New York City; Reland B. Westgate, Sun Shipbuilding and Dry Dock Company, Chester, Pa.; Bernard B. Birdsall, Bethlehem Shipbuilding Corporation, Quincy, Mass.; Ross E. Black, Gibbs and Cox, Inc., New York City; Harry D. Crapon, Combustion Engineering Company, Inc., Monongahela, Pa.; F. Lawrence Moore, Jr., Terry Steam Turbine Company, Hartford, Conn.; George F. Cary, 2d, Isthmian Steamship Lines, New York City; S. Curtis Powell, graduate work at the University of Genoa, Italy; Eric Swenson, United Fruit Lines; James B. Henderson, Maryland Dry Dock Company, Inc., Baltimore, Md.

"As for myself, I was enrolled in the college training group with the Goodyear Company in Akron, Ohio, from June until September and then returned to the Institute as an assistant in the mechan-

ical engineering lab, doing graduate work in addition; it certainly is ever so interesting to be on the 'giving' side and I am learning a lot of the little details which I missed when I was an undergraduate. The graduate studies, however, point out how little I know about a whole lot — such a sad revelation! If you will forgive the general heterogeneity of this letter and if it will in a measure serve as an impetus for more information forthcoming from our classmates, I will consider its purpose fulfilled and thus saying, I am — Your quondam schoolfellow — Al."

Random notes here and there: Richard A. Flinn, Jr., is on the staff of International Nickel Company, Bayonne, N.J. E. M. Krisman is on the staff of the American Smelting and Refining Company, at Tacoma, Wash. Kenneth W. Winsor is on duty with the Navy Aviation Detachment at Coco Solo, Canal Zone. L. A. Seder, X, joined the General Electric Company as a student engineer recently and at present is located at the Lynn plant of the company. From Charlie Locke '96, I learned that Norman Birch, whose address is 2014 Logan Avenue, Middletown, Ohio, and who is with the American Rolling Mill Company in Middletown, writes that he is much interested in his work, and that since he arrived in Middletown in the early part of July he has spent three weeks in the employment reserve (which supplies men for all temporary vacancies), two months drilling samples in the open hearth control laboratory, and recently has been transferred to the metallurgical division to work as a checker on the temper rolls and in galvanizing. This last job gives him real contact with the men who are in actual production and an opportunity to learn about the production of sheets at the same time. Middletown is an excellent community, and Birch is finding his relations to be most friendly, so that he is enjoying life immensely." — WINTHROP A. JOHNS, *General Secretary*, 114 Beechwood Avenue, Bound Brook, N.J.

## *When Good Fellows Get Together*

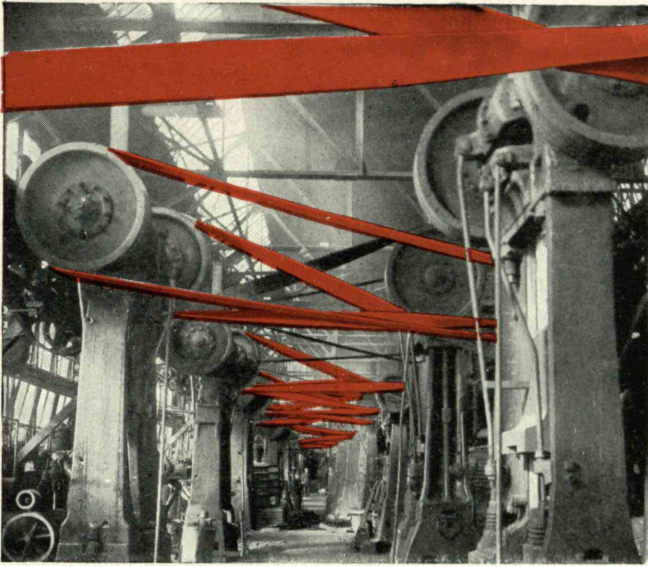
. . . at Alumni Dinners, Club Meetings, in the pages of The Review, in the Alumni Fund Campaign, IT IS ALWAYS FAIRER WEATHER.

The Review finds throughout the country evidence that Tech's Stein Song says something peculiarly and increasingly true about Tech Men. It believes that it is helping to make this so, and that Alumni more and more look to The Review as a place . . .

## *Where Good Fellows Get Together*



# MORE POWER ON THE TOUGH DRIVES



Battery of drop forges with 4,000 lb. drop hammers in a steel plant, completely equipped with Condor Compensated Belts. Sudden jerks and heavy loads make this an exceedingly hard drive.

In every plant there are one or more drives that are unusually hard on belts. Drives such as the one shown above where sudden jerks, unusual stresses and strains, and heavy loads soon begin to cause belts to lose their pulling power.

Condor Compensated Belts are especially designed for these tough drives. Results from many field installations show that ply rupture, ply separation, and fastener wear have been reduced to a minimum by the exclusive compensated construction. Naturally, as a result, Condor Compensated lasts longer, performs better.

Built so that stresses and strains developed at the arc of contact—where the destructive work is done—are equalized, Condor Compensated Belts have 12 advantages\* that increase belt life . . . keep maintenance costs and troubles at a minimum—even on the toughest drives.

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Contractors Hose  
Sand Blast Hose  
Suction Hose  
Fire Hose  
Molded Rubber Goods  
Rubber Lined Tanks  
Rubber Covered Rolls

Chute Lining  
Lauder Lining  
Industrial Brake Elocks  
and Linings  
Abrasive Wheels—  
Rubber Bonded

### \* 12 ADVANTAGES

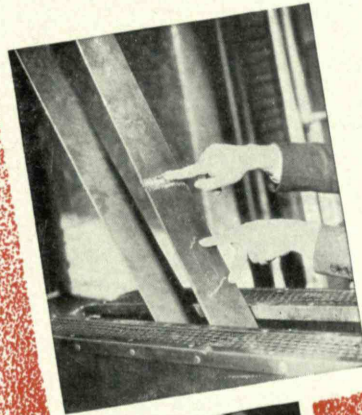
1. Ruptures in outside ply eliminated.
2. Freedom from ply separation.
3. Longer fastener life.
4. Can be operated on smaller pulleys.
5. Less bearing, shafting and hanger troubles.
6. For heavy loads, plies may be increased with same pulleys.
7. Operation less affected by atmospheric conditions.
8. Higher overload capacity or margin of safety.
9. Less wear on pulley side.
10. Can be dressed without injury to belt.
11. High production efficiency.
12. Material reduction in belting costs.

Available also in Types F & B for drives where some slip is desirable

## Condor Compensated

PATENTED  
TRADE MARK REGISTERED

The Low Tension Rubber Belt  
with Equalized Ply Stresses



Unretouched photographs of ordinary rubber belt and Condor Compensated Belt after operating an equal number of hours on the same type drive. Notice lower belt has no "broken back" and no fastener wear—it's Condor Compensated.

Col. Arthur F. Townsend, '84  
Thomas H. Boyd, '23  
Wilder E. Perkins, '25  
Charles P. McHugh, '26  
Daniel J. Hanlon, '37



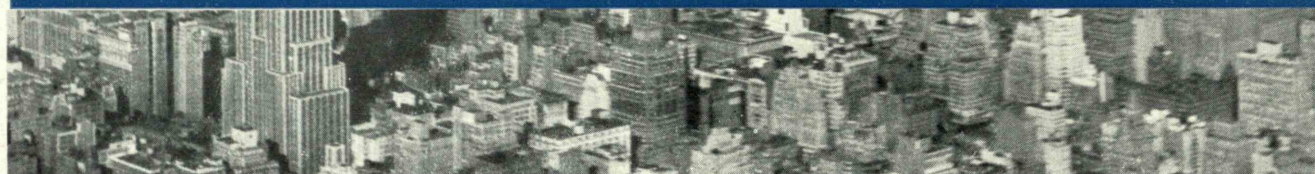
**THE MANHATTAN RUBBER MFG. DIVISION**  
OF RAYBESTOS-MANHATTAN, INC.

EXECUTIVE OFFICES AND FACTORIES, 36 TOWNSEND ST., PASSAIC, N. J.





## RADIO AIDS TO AIR NAVIGATION



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General Radio measuring equipment is used regularly to check the design and performance of aircraft transmitters and receivers by lines such as American, Braniff, Delta, Eastern, North American, Northwest, Pan American and United, to mention a few. In addition, the aircraft departments of the U. S. Government, including the Army, Navy, Coast Guard and Department of Commerce, are large users of G-R apparatus.

General Radio equipment for aircraft

use includes standard-signal generators, primary and secondary frequency standards, beat-frequency oscillators, power-level indicators, heterodyne frequency meters, radio-frequency bridges, standards of resistance inductance and capacitance, wave analyzers, noise and vibration meters and many other instruments and accessories.

Air transportation demands the highest precision, accuracy and stability and the latest engineering design in radio laboratory equipment. Airlines rely on G-R equipment. You can depend on their choice.

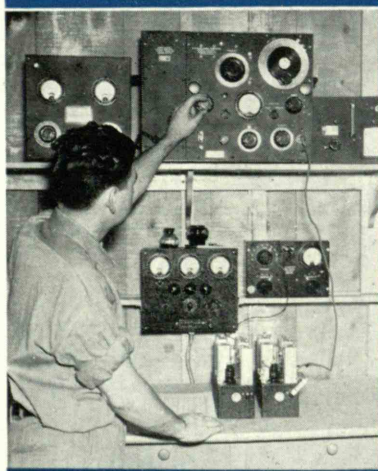
● Write for Bulletin 227 for complete information on all General Radio products.

**GENERAL RADIO COMPANY • CAMBRIDGE, MASSACHUSETTS**

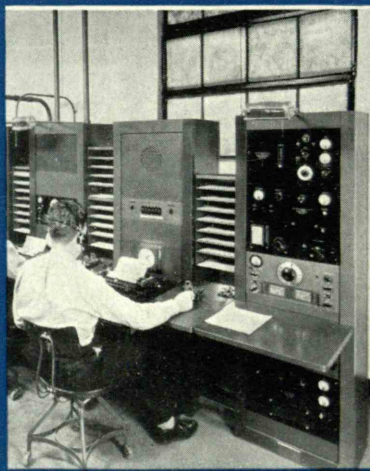
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